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(54) Title: CLONING OF CYTOCHROME P450 GENES FROM NICOTIANA

(57) Abstract: The present invention relates to p450 enzymes and nucleic acid sequences encoding p450 enzymes in Nicotiana, and methods of using those enzymes and nucleic acid sequences to alter plant phenotypes.



**WO 2005/038033 A2**

## CLONING OF CYTOCHROME P450 GENES FROM NICOTIANA

The present invention relates to nucleic acid sequences encoding cytochrome p450 enzymes (hereinafter referred to as p450 and p450 enzymes) in *Nicotiana* plants and methods for using those nucleic acid sequences to alter plant phenotypes.

### BACKGROUND

Cytochrome p450s catalyze enzymatic reactions for a diverse range of chemically dissimilar substrates that include the oxidative, peroxidative and reductive metabolism of endogenous and xenobiotic substrates. In plants, p450s participate in biochemical pathways that include the synthesis of plant products such as phenylpropanoids, alkaloids, terpenoids, lipids, cyanogenic glycosides, and glucosinolates (Chappel, Annu. Rev. Plant Physiol. Plant Mol. Biol. 198, 49:311-343). Cytochrome p450s, also known as p450 heme-thiolate proteins, usually act as terminal oxidases in multi-component electron transfer chains, called p450- containing monooxygenase systems. Specific reactions catalyzed include demethylation, hydroxylation, epoxidation, N-oxidation, sulfoxidation, N-, S-, and O- dealkylations, desulfation, deamination, and reduction of azo, nitro, and N-oxide groups.

The diverse role of *Nicotiana* plant p450 enzymes has been implicated in effecting a variety of plant metabolites such as phenylpropanoids, alkaloids, terpenoids, lipids, cyanogenic glycosides, glucosinolates and a host of other chemical

entities. During recent years, it is becoming apparent that some p450 enzymes can impact the composition of plant metabolites in plants. For example, it has been long desired to improve the flavor and aroma of certain plants by altering its profile of selected fatty acids through breeding; however very little is known about mechanisms involved in controlling the levels of these leaf constituents. The down regulation of p450 enzymes associated with the modification of fatty acids may facilitate accumulation of desired fatty acids that provide more preferred leaf phenotypic qualities. The function of p450 enzymes and their broadening roles in plant constituents is still being discovered. For instance, a special class of p450 enzymes was found to catalyze the breakdown of fatty acid into volatile C6- and C9-aldehydes and -alcohols that are major contributors of "fresh green" odor of fruits and vegetables. The level of other novel targeted p450s may be altered to enhance the qualities of leaf constituents by modifying lipid composition and related break down metabolites in *Nicotiana* leaf. Several of these constituents in leaf are affected by senescence that stimulates the maturation of leaf quality properties. Still other reports have shown that p450s enzymes are play a functional role in altering fatty acids that are involved in plant-pathogen interactions and disease resistance.

In other instances, p450 enzymes have been suggested to be involved in alkaloid biosynthesis. Nornicotine is a minor alkaloid found in *Nicotiana tabaceum*. It has been postulated that it is produced by the p450 mediated demethylation of

nicotine followed by acylation and nitrosation at the N position thereby producing a series of N-acylnicotines and N-nitrosotobaccoamines. N-demethylation, catalyzed by a putative p450 demethylase, is thought to be a primary source of nicotine biosynthesis in *Nicotiana*. While the enzyme is believed to be microsomal, thus far a nicotine demethylase enzyme has not been successfully purified, nor have the genes involved been isolated.

Furthermore, it is hypothesized but not proven that the activity of p450 enzymes is genetically controlled and also strongly influenced by environment factors. For example, the demethylation of nicotine in *Nicotiana* is thought to increase substantially when the plants reach a mature stage. Furthermore, it is hypothesized yet not proven that the demethylase gene contains a transposable element that can inhibit translation of RNA when present.

The large multiplicity of p450 enzyme forms, their differing structure and function have made their research on *Nicotiana* p450 enzymes very difficult before the enclosed invention. In addition, cloning of p450 enzymes has been hampered at least in part because these membrane-localized proteins are typically present in low abundance and often unstable to purification. Hence, a need exists for the identification of p450 enzymes in plants and the nucleic acid sequences associated with those p450 enzymes. In particular, only a few cytochrome p450 proteins have been reported in *Nicotiana*. The inventions described herein entail the

discovery of a substantial number of cytochrome p450 fragments that correspond to several groups of p450 species based on their sequence identity.

#### SUMMARY

5           The present invention is directed to plant p450 enzymes. The present invention is further directed to plant p450 enzymes from *Nicotiana*. The present invention is also directed to p450 enzymes in plants whose expression is induced  
10 by ethylene and/or plant senescence. The present invention is yet further directed to nucleic acid sequences in plants having enzymatic activities, for example, being categorized as oxygenase, demethylase and the like, or other and the use of those sequences to reduce or silence the expression or over-  
15 expression of these enzymes. The invention also relates to p450 enzymes found in plants containing higher nornicotine levels than plants exhibiting lower nornicotine levels.

          In one aspect, the invention is directed to nucleic acid  
20 sequences as set forth in SEQ. ID. Nos. 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129,  
25 131, 133, 135, 137, 139, 143, 145, 147, 149, 151, 153, 155, 157, 159, 161, 163, 165, 167, 169, 171, 173, 175, 177, 179, 181, 183, 185, 187, 189, 191, 193, 195, 197, 199, 201, 203, 205, 207, 209, 211, 213, 215, 217, 219, 221, 223, 225, 227, 229, 231, 233, 235, 237, 239, 241, 243, 245, 247, 249, 251,

253, 255, 257, 259, 261, 263, 265, 267, 269, 271, 273, 275,  
277, 279, 281, 283, 285, 287, 289, 291, 293, 295, 297, 299,  
301, 303, 305, 307, 309, 311, 313 and 315.

5           In a second related aspect, those fragments containing  
greater than 75% identity in nucleic acid sequence were placed  
into groups dependent upon their identity in a region  
corresponding to the first nucleic acid following the  
cytochrome p450 motif GXRXCX(G/A) to the stop codon. The  
10       representative nucleic acid groups and respective species are  
shown in Table I.

          In a third aspect, the invention is directed to amino  
acid sequences as set forth in SEQ. ID. Nos. 2, 4, 6, 8, 10,  
15       12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40,  
42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70,  
72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 96, 98, 100, 102,  
104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126,  
128, 130, 132, 134, 136, 138, 140, 144, 146, 148, 150, 152,  
20       154, 156, 158, 160, 162, 164, 166, 168, 170, 172, 174, 176,  
178, 180, 182, 184, 186, 188, 190, 192, 194, 196, 198, 200,  
202, 204, 206, 208, 210, 212, 214, 216, 218, 220, 222, 224,  
226, 228, 230, 232, 234, 236, 238, 240, 242, 244, 246, 248,  
250, 252, 254, 256, 258, 260, 262, 264, 266, 268, 270, 272,  
25       274, 276, 278, 280, 282, 284, 286, 288, 290, 292, 294, 296,  
298, 300, 302, 304, 306, 308, 310, 312, 314 and 316.

          In a fourth related aspect, those fragments containing  
greater than 71% identity in amino acid sequence were placed  
30       into groups dependent upon their identity to each other in a

region corresponding to the first amino acid following the cytochrome p450 motif GXRXCX(G/A) to the stop codon. The representative amino acid groups and respective species are shown in Table II.

5

10

15

In a fifth aspect, the invention is directed to amino acid sequences of full length genes as set forth in SEQ. ID. Nos. 150, 152, 154, 156, 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180, 182, 184, 186, 188, 190, 192, 194, 196, 198, 200, 202, 204, 206, 208, 210, 212, 214, 216, 218, 220, 222, 224, 226, 228, 230, 232, 234, 236, 238, 240, 242, 244, 246, 248, 250, 252, 254, 256, 258, 260, 262, 264, 266, 268, 270, 272, 274, 276, 278, 280, 282, 284, 286, 288, 290, 292, 294, 296, 298, 300, 302, 304, 306, 308, 310, 312, 314 and 316.

20

In a sixth related aspect, those full length genes containing 85% or greater identity in amino acid sequence were placed into groups dependent upon the identity to each other. The representative amino acid groups and respective species are shown in Table III.

25

In a seventh aspect, the invention is directed to amino acid sequences of the fragments set forth in SEQ. ID. Nos. 299-357.

30

In the eighth related aspect, those fragments containing 90% or greater identity in amino acid sequence were placed into groups dependent upon their identity to each other in a region corresponding to the first cytochrome p450 domain,

UXXRXXZ, to the third cytochrome domain, GXR XO, where U is E or K, X is any amino acid and Z is R, T, S or M. The representative amino acid groups respective species shown in Table IV.

5

In a ninth related aspect, the reduction or elimination or over-expression of p450 enzymes in Nicotiana plants may be accomplished transiently using RNA viral systems.

10

Resulting transformed or infected plants are assessed for phenotypic changes including, but not limited to, analysis of endogenous p450 RNA transcripts, p450 expressed peptides, and concentrations of plant metabolites using techniques commonly available to one having ordinary skill in the art.

15

In a tenth important aspect, the present invention is also directed to generation of transgenic Nicotiana lines that have altered p450 enzyme activity levels. In accordance with the invention, these transgenic lines include nucleic acid sequences that are effective for reducing or silencing or increasing the expression of certain enzyme thus resulting in phenotypic effects within Nicotiana. Such nucleic acid sequences include SEQ. ID. Nos. 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 143, 145, 147, 149, 151, 153, 155, 157, 159, 161, 163, 165, 167, 169, 171, 173, 175, 177, 179, 181, 183, 185, 187, 189, 191, 193, 195, 197, 199, 201, 203, 205,

20

25

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207, 209, 211, 213, 215, 217, 219, 221, 223, 225, 227, 229,  
231, 233, 235, 237, 239, 241, 243, 245, 247, 249, 251, 253,  
255, 257, 259, 261, 263, 265, 267, 269, 271, 273, 275, 277,  
279, 281, 283, 285, 287, 289, 291, 293, 295, 297, 299, 301,  
5 303, 305, 307, 309, 311, 313 and 315.

In a very important eleventh aspect of the invention,  
plant cultivars including nucleic acids of the present  
invention in a down regulation capacity using either full  
10 length genes or fragments thereof or in an over-expression  
capacity using full length genes will have altered metabolite  
profiles relative to control plants.

In a twelfth aspect of the invention, plant cultivars  
15 including nucleic acid of the present invention using either  
full length genes or fragments thereof in modifying the  
biosynthesis or breakdown of metabolites derived from the  
plant or external to the plants, will have use in tolerating  
certain exogenous chemicals or plant pests. Such nucleic acid  
20 sequences include SEQ ID. Nos. 1, 3, 5, 7, 9, 11, 13, 15, 17,  
19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47,  
49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77,  
79, 81, 83, 85, 87, 89, 91, 95, 97, 99, 101, 103, 105, 107,  
109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131,  
25 133, 135, 137, 139, 143, 145, 147, 149, 151, 153, 155, 157,  
159, 161, 163, 165, 167, 169, 171, 173, 175, 177, 179, 181,  
183, 185, 187, 189, 191, 193, 195, 197, 199, 201, 203, 205,  
207, 209, 211, 213, 215, 217, 219, 221, 223, 225, 227, 229,  
231, 233, 235, 237, 239, 241, 243, 245, 247, 249, 251, 253,  
30 255, 257, 259, 261, 263, 265, 267, 269, 271, 273, 275, 277,

279, 281, 283, 285, 287, 289, 291, 293, 295, 297, 299, 301,  
303, 305, 307, 309, 311, 313 and 315.

In a thirteenth aspect, the present invention is directed  
5 to the screening of plants, more preferably *Nicotiana*, that  
contain genes that have substantial nucleic acid identity to  
the taught nucleic acid sequence. The use of the invention  
would be advantageous to identify and select plants that  
contain a nucleic acid sequence with exact or substantial  
10 identity where such plants are part of a breeding program for  
traditional or transgenic varieties, a mutagenesis program, or  
naturally occurring diverse plant populations. The screening  
of plants for substantial nucleic acid identity may be  
accomplished by evaluating plant nucleic acid materials using  
15 a nucleic acid probe in conjunction with nucleic acid  
detection protocols including, but not limited to, nucleic  
acid hybridization and PCR analysis. The nucleic acid probe  
may consist of the taught nucleic acid sequence or fragment  
thereof corresponding to SEQ ID 1, 3, 5, 7, 9, 11, 13, 15, 17,  
20 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47,  
49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77,  
79, 81, 83, 85, 87, 89, 91, 95, 97, 99, 101, 103, 105, 107,  
109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131,  
133, 135, 137, 139, 143, 145, 147, 149, 151, 153, 155, 157,  
25 159, 161, 163, 165, 167, 169, 171, 173, 175, 177, 179, 181,  
183, 185, 187, 189, 191, 193, 195, 197, 199, 201, 203, 205,  
207, 209, 211, 213, 215, 217, 219, 221, 223, 225, 227, 229,  
231, 233, 235, 237, 239, 241, 243, 245, 247, 249, 251, 253,  
255, 257, 259, 261, 263, 265, 267, 269, 271, 273, 275, 277,

279, 281, 283, 285, 287, 289, 291, 293, 295, 297, 299, 301, 303, 305, 307, 309, 311, 313 and 315.

In a fourteenth aspect, the present invention is directed to the identification of plant genes, more preferably Nicotiana, that share substantial amino acid identity corresponding to the taught nucleic acid sequence. The identification of plant genes including both cDNA and genomic clones, those cDNAs and genomic clones, more preferably from Nicotiana may be accomplished by screening plant cDNA libraries using a nucleic acid probe in conjunction with nucleic acid detection protocols including, but not limited to, nucleic acid hybridization and PCR analysis. The nucleic acid probe may be comprised of nucleic acid sequence or fragment thereof corresponding to SEQ ID 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 143, 145 and 147.

In an alternative fifteenth aspect, cDNA expression libraries that express peptides may be screened using antibodies directed to part or all of the taught amino acid sequence. Such amino acid sequences include SEQ ID 2, 4, 8, 9, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 144, 146, 148.

In a sixteenth important aspect, the present invention is also directed to generation of transgenic *Nicotiana* lines that have over-expression of p450 enzyme activity levels. In accordance with the invention, these transgenic lines include all nucleic acid sequences encoding the amino acid sequences of full length genes that are effective for increasing the expression of certain enzyme thus resulting in phenotypic effects within *Nicotiana*. Such amino acid sequences include SEQ. ID. 150, 152, 154, 156, 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180, 182, 184, 186, 188, 190, 192, 194, 196, 198, 200, 202, 204, 206, 208, 210, 212, 214, 216, 218, 220, 222, 224, 226, 228, 230, 232, 234, 236, 238, 240, 242, 244, 246, 248, 250, 252, 254, 256, 258, 260, 262, 264, 266, 268, 270, 272, 274, 276, 278, 280, 282, 284, 286, 288, 290, 292, 294, 296, 298, 300, 302, 304, 306, 308, 310, 312, 314 and 316.

A tobacco product is also provided that includes tobacco leaf (lamina and/or stem) having reduced amounts of nornicotine. The tobacco product includes tobacco (tobacco leaf including lamina and/or stem) from a plant that includes the sequences described herein or where genes encoding tobacco specific nitrosamines have been eliminated or suppressed. The elimination or suppression of genes encoding tobacco specific nitrosamines is effective for reducing tobacco specific nitrosamines in the tobacco products from about 5 to about 10%, in another aspect from about 10 to 20%, in another aspect about 20 to 30%, and in another aspect greater than 30%, as compared to tobacco products made from tobacco plants where genes coding for tobacco specific nitrosamines have not been eliminated or suppressed. As used herein, the tobacco product may include cigarettes, cigars, pipe tobacco, snuff chewing

tobacco, products blended with the tobacco product, and mixtures thereof.

#### BRIEF DESCRIPTION OF DRAWINGS

5           Figure 1 shows nucleic acid SEQ. ID. No.:1 and amino acid SEQ. ID. No.:2.

          Figure 2 shows nucleic acid SEQ. ID. No.:3 and amino acid SEQ. ID. No.:4.

10           Figure 3 shows nucleic acid SEQ. ID. No.:5 and amino acid SEQ. ID. No.:6.

          Figure 4 shows nucleic acid SEQ. ID. No.:7 and amino acid SEQ. ID. No.:8.

          Figure 5 shows nucleic acid SEQ. ID. No.:9 and amino acid SEQ. ID. No.:10.

15           Figure 6 shows nucleic acid SEQ. ID. No.:11 and amino acid SEQ. ID. No.:12.

          Figure 7 shows nucleic acid SEQ. ID. No.:13 and amino acid SEQ. ID. No.:14.

20           Figure 8 shows nucleic acid SEQ. ID. No.:15 and amino acid SEQ. ID. No.:16.

          Figure 9 shows nucleic acid SEQ. ID. No.:17 and amino acid SEQ. ID. No.:18.

          Figure 10 shows nucleic acid SEQ. ID. No.:19 and amino acid SEQ. ID. No.:20.

25           Figure 11 shows nucleic acid SEQ. ID. No.:21 and amino acid SEQ. ID. No.:22.

          Figure 12 shows nucleic acid SEQ. ID. No.:23 and amino acid SEQ. ID. No.:24.

30           Figure 13 shows nucleic acid SEQ. ID. No.:25 and amino acid SEQ. ID. No.:26.

Figure 14 shows nucleic acid SEQ. ID. No.:27 and amino acid SEQ. ID. No.:28.

Figure 15 shows nucleic acid SEQ. ID. No.:29 and amino acid SEQ. ID. No.:30.

5 Figure 16 shows nucleic acid SEQ. ID. No.:31 and amino acid SEQ. ID. No.:32.

Figure 17 shows nucleic acid SEQ. ID. No.:33 and amino acid SEQ. ID. No.:34.

10 Figure 18 shows nucleic acid SEQ. ID. No.:35 and amino acid SEQ. ID. No.:36.

Figure 19 shows nucleic acid SEQ. ID. No.:37 and amino acid SEQ. ID. No.:38.

Figure 20 shows nucleic acid SEQ. ID. No.:39 and amino acid SEQ. ID. No.:40.

15 Figure 21 shows nucleic acid SEQ. ID. No.:41 and amino acid SEQ. ID. No.:42.

Figure 22 shows nucleic acid SEQ. ID. No.:43 and amino acid SEQ. ID. No.:44.

20 Figure 23 shows nucleic acid SEQ. ID. No.:45 and amino acid SEQ. ID. No.:46.

Figure 24 shows nucleic acid SEQ. ID. No.:47 and amino acid SEQ. ID. No.:48.

Figure 25 shows nucleic acid SEQ. ID. No.:49 and amino acid SEQ. ID. No.:50.

25 Figure 26 shows nucleic acid SEQ. ID. No.:51 and amino acid SEQ. ID. No.:52.

Figure 27 shows nucleic acid SEQ. ID. No.:53 and amino acid SEQ. ID. No.:54.

30 Figure 28 shows nucleic acid SEQ. ID. No.:55 and amino acid SEQ. ID. No.:56.

Figure 29 shows nucleic acid SEQ. ID. No.:57 and amino

acid SEQ. ID. No.:58.

Figure 30 shows nucleic acid SEQ. ID. No.:59 and amino acid SEQ. ID. No.:60.

Figure 31 shows nucleic acid SEQ. ID. No.:61 and amino acid SEQ. ID. No.:62.

Figure 32 shows nucleic acid SEQ. ID. No.:63 and amino acid SEQ. ID. No.:64.

Figure 33 shows nucleic acid SEQ. ID. No.:65 and amino acid SEQ. ID. No.:66.

Figure 34 shows nucleic acid SEQ. ID. No.:67 and amino acid SEQ. ID. No.:68.

Figure 35 shows nucleic acid SEQ. ID. No.:69 and amino acid SEQ. ID. No.:70.

Figure 36 shows nucleic acid SEQ. ID. No.:71 and amino acid SEQ. ID. No.:72.

Figure 37 shows nucleic acid SEQ. ID. No.:73 and amino acid SEQ. ID. No.:74.

Figure 38 shows nucleic acid SEQ. ID. No.:75 and amino acid SEQ. ID. No.:76.

Figure 39 shows nucleic acid SEQ. ID. No.:77 and amino acid SEQ. ID. No.:78.

Figure 40 shows nucleic acid SEQ. ID. No.:79 and amino acid SEQ. ID. No.:80.

Figure 41 shows nucleic acid SEQ. ID. No.:81 and amino acid SEQ. ID. No.:82.

Figure 42 shows nucleic acid SEQ. ID. No.:83 and amino acid SEQ. ID. No.:84.

Figure 43 shows nucleic acid SEQ. ID. No.:85 and amino acid SEQ. ID. No.:86.

Figure 44 shows nucleic acid SEQ. ID. No.:87 and amino acid SEQ. ID. No.:88.

Figure 45 shows nucleic acid SEQ. ID. No.:89 and amino acid SEQ. ID. No.:90.

Figure 46 shows nucleic acid SEQ. ID. No.:91 and amino acid SEQ. ID. No.:92.

5 Figure 48 shows nucleic acid SEQ. ID. No.:95 and amino acid SEQ. ID. No.:96.

Figure 49 shows nucleic acid SEQ. ID. No.:97 and amino acid SEQ. ID. No.:98.

10 Figure 50 shows nucleic acid SEQ. ID. No.:99 and amino acid SEQ. ID. No.:100.

Figure 51 shows nucleic acid SEQ. ID. No.:101 and amino acid SEQ. ID. No.:102.

Figure 52 shows nucleic acid SEQ. ID. No.:103 and amino acid SEQ. ID. No.:104.

15 Figure 53 shows nucleic acid SEQ. ID. No.:105 and amino acid SEQ. ID. No.:106.

Figure 54 shows nucleic acid SEQ. ID. No.:107 and amino acid SEQ. ID. No.:108.

20 Figure 55 shows nucleic acid SEQ. ID. No.:109 and amino acid SEQ. ID. No.:110.

Figure 56 shows nucleic acid SEQ. ID. No.:111 and amino acid SEQ. ID. No.:112.

Figure 57 shows nucleic acid SEQ. ID. No.:113 and amino acid SEQ. ID. No.:114.

25 Figure 58 shows nucleic acid SEQ. ID. No.:115 and amino acid SEQ. ID. No.:116.

Figure 59 shows nucleic acid SEQ. ID. No.:117 and amino acid SEQ. ID. No.:118.

30 Figure 60 shows nucleic acid SEQ. ID. No.:119 and amino acid SEQ. ID. No.:120.

Figure 61 shows nucleic acid SEQ. ID. No.:121 and amino

acid SEQ. ID. No.:122.

Figure 62 shows nucleic acid SEQ. ID. No.:123 and amino acid SEQ. ID. No.:124.

Figure 63 shows nucleic acid SEQ. ID. No.:125 and amino acid SEQ. ID. No.:126.

Figure 64 shows nucleic acid SEQ. ID. No.:127 and amino acid SEQ. ID. No.:128.

Figure 65 shows nucleic acid SEQ. ID. No.:129 and amino acid SEQ. ID. No.:130.

Figure 66 shows nucleic acid SEQ. ID. No.:131 and amino acid SEQ. ID. No.:132.

Figure 67 shows nucleic acid SEQ. ID. No.:133 and amino acid SEQ. ID. No.:134.

Figure 68 shows nucleic acid SEQ. ID. No.:135 and amino acid SEQ. ID. No.:136.

Figure 69 shows nucleic acid SEQ. ID. No.:137 and amino acid SEQ. ID. No.:138.

Figure 70 shows nucleic acid SEQ. ID. No.:139 and amino acid SEQ. ID. No.:140.

Figure 72 shows nucleic acid SEQ. ID. No.:143 and amino acid SEQ. ID. No.:144.

Figure 73 shows nucleic acid SEQ. ID. No.:145 and amino acid SEQ. ID. No.:146.

Figure 74 shows nucleic acid SEQ. ID. No.:147 and amino acid SEQ. ID. No.:148.

Figure 75 shows nucleic acid SEQ. ID No.: 149 and amino acid SEQ. ID. No.: 150.

Figure 76 shows nucleic acid SEQ. ID No.: 151 and amino acid SEQ. ID. No.: 152.

Figure 77 shows nucleic acid SEQ. ID No.: 153 and amino acid SEQ. ID. No.: 154.

Figure 78 shows nucleic acid SEQ. ID No.: 155 and amino acid SEQ. ID. No.: 156.

Figure 79 shows nucleic acid SEQ. ID No.: 157 and amino acid SEQ. ID. No.: 158.

Figure 80 shows nucleic acid SEQ. ID No.: 159 and amino acid SEQ. ID. No.: 160.

Figure 81 shows nucleic acid SEQ. ID No.: 161 and amino acid SEQ. ID. No.: 162.

Figure 82 shows nucleic acid SEQ. ID No.: 163 and amino acid SEQ. ID. No.: 164.

Figure 83 shows nucleic acid SEQ. ID No.: 165 and amino acid SEQ. ID. No.: 166.

Figure 84 shows nucleic acid SEQ. ID No.: 167 and amino acid SEQ. ID. No.: 168.

Figure 85 shows nucleic acid SEQ. ID No.: 169 and amino acid SEQ. ID. No.: 170.

Figure 86 shows nucleic acid SEQ. ID No.: 171 and amino acid SEQ. ID. No.: 172.

Figure 87 shows nucleic acid SEQ. ID No.: 173 and amino acid SEQ. ID. No.: 174.

Figure 88 shows nucleic acid SEQ. ID No.: 175 and amino acid SEQ. ID. No.: 176.

Figure 89 shows nucleic acid SEQ. ID No.: 177 and amino acid SEQ. ID. No.: 178.

Figure 90 shows nucleic acid SEQ. ID No.: 179 and amino acid SEQ. ID. No.: 180.

Figure 91 shows nucleic acid SEQ. ID No.: 181 and amino acid SEQ. ID. No.: 182.

Figure 92 shows nucleic acid SEQ. ID No.: 183 and amino acid SEQ. ID. No.: 184.

Figure 93 shows nucleic acid SEQ. ID No.: 185 and amino

acid SEQ. ID. No.: 186.

Figure 94 shows nucleic acid SEQ. ID No.: 187 and amino acid SEQ. ID. No.: 188.

Figure 95 shows nucleic acid SEQ. ID No.: 189 and amino acid SEQ. ID. No.: 190.

Figure 96 shows nucleic acid SEQ. ID No.: 191 and amino acid SEQ. ID. No.: 192.

Figure 97 shows nucleic acid SEQ. ID No.: 193 and amino acid SEQ. ID. No.: 194.

Figure 98 shows nucleic acid SEQ. ID No.: 195 and amino acid SEQ. ID. No.: 196.

Figure 99 shows nucleic acid SEQ. ID No.: 197 and amino acid SEQ. ID. No.: 198.

Figure 100 shows nucleic acid SEQ. ID No.: 199 and amino acid SEQ. ID. No.: 200.

Figure 101 shows nucleic acid SEQ. ID No.: 201 and amino acid SEQ. ID. No.: 202.

Figure 102 shows nucleic acid SEQ. ID No.: 203 and amino acid SEQ. ID. No.: 204.

Figure 103 shows nucleic acid SEQ. ID No.: 205 and amino acid SEQ. ID. No.: 206.

Figure 104 shows nucleic acid SEQ. ID No.: 207 and amino acid SEQ. ID. No.: 208.

Figure 105 shows nucleic acid SEQ. ID No.: 209 and amino acid SEQ. ID. No.: 210.

Figure 106 shows nucleic acid SEQ. ID No.: 211 and amino acid SEQ. ID. No.: 212.

Figure 107 shows nucleic acid SEQ. ID No.: 213 and amino acid SEQ. ID. No.: 214.

Figure 108 shows nucleic acid SEQ. ID No.: 215 and amino acid SEQ. ID. No.: 216.

Figure 109 shows nucleic acid SEQ. ID No.: 217 and amino acid SEQ. ID. No.: 218.

Figure 110 shows nucleic acid SEQ. ID No.: 219 and amino acid SEQ. ID. No.: 220.

5       Figure 111 shows nucleic acid SEQ. ID No.: 221 and amino acid SEQ. ID. No.: 222.

Figure 112 shows nucleic acid SEQ. ID No.: 223 and amino acid SEQ. ID. No.: 224.

10       Figure 113 shows nucleic acid SEQ. ID No.: 225 and amino acid SEQ. ID. No.: 226.

Figure 114 shows nucleic acid SEQ. ID No.: 227 and amino acid SEQ. ID. No.: 228.

Figure 115 shows nucleic acid SEQ. ID No.: 229 and amino acid SEQ. ID. No.: 230.

15       Figure 116 shows nucleic acid SEQ. ID No.: 231 and amino acid SEQ. ID. No.: 232.

Figure 117 shows nucleic acid SEQ. ID No.: 233 and amino acid SEQ. ID. No.: 234.

20       Figure 118 shows nucleic acid SEQ. ID No.: 235 and amino acid SEQ. ID. No.: 236.

Figure 119 shows nucleic acid SEQ. ID No.: 237 and amino acid SEQ. ID. No.: 238.

Figure 120 shows nucleic acid SEQ. ID No.: 239 and amino acid SEQ. ID. No.: 240.

25       Figure 121 shows nucleic acid SEQ. ID No.: 241 and amino acid SEQ. ID. No.: 242.

Figure 122 shows nucleic acid SEQ. ID No.: 243 and amino acid SEQ. ID. No.: 244.

30       Figure 123 shows nucleic acid SEQ. ID No.: 245 and amino acid SEQ. ID. No.: 246.

Figure 124 shows nucleic acid SEQ. ID No.: 247 and amino

acid SEQ. ID. No.: 248.

Figure 125 shows nucleic acid SEQ. ID No.: 249 and amino acid SEQ. ID. No.: 250.

Figure 126 shows nucleic acid SEQ. ID No.: 251 and amino acid SEQ. ID. No.: 252.

Figure 127 shows nucleic acid SEQ. ID No.: 253 and amino acid SEQ. ID. No.: 254.

Figure 128 shows nucleic acid SEQ. ID No.: 255 and amino acid SEQ. ID. No.: 256.

Figure 129 shows nucleic acid SEQ. ID No.: 257 and amino acid SEQ. ID. No.: 258.

Figure 130 shows nucleic acid SEQ. ID No.: 259 and amino acid SEQ. ID. No.: 260.

Figure 131 shows nucleic acid SEQ. ID No.: 261 and amino acid SEQ. ID. No.: 262.

Figure 132 shows nucleic acid SEQ. ID No.: 263 and amino acid SEQ. ID. No.: 264.

Figure 133 shows nucleic acid SEQ. ID No.: 265 and amino acid SEQ. ID. No.: 266.

Figure 134 shows nucleic acid SEQ. ID No.: 267 and amino acid SEQ. ID. No.: 268.

Figure 135 shows nucleic acid SEQ. ID No.: 269 and amino acid SEQ. ID. No.: 270.

Figure 136 shows nucleic acid SEQ. ID No.: 271 and amino acid SEQ. ID. No.: 272.

Figure 137 shows nucleic acid SEQ. ID No.: 273 and amino acid SEQ. ID. No.: 274.

Figure 138 shows nucleic acid SEQ. ID No.: 275 and amino acid SEQ. ID. No.: 276.

Figure 139 shows nucleic acid SEQ. ID No.: 277 and amino acid SEQ. ID. No.: 278.

Figure 140 shows nucleic acid SEQ. ID No.: 279 and amino acid SEQ. ID. No.: 280.

Figure 141 shows nucleic acid SEQ. ID No.: 281 and amino acid SEQ. ID. No.: 282.

5 Figure 142 shows nucleic acid SEQ. ID No.: 283 and amino acid SEQ. ID. No.: 284.

Figure 143 shows nucleic acid SEQ. ID No.: 285 and amino acid SEQ. ID. No.: 286.

10 Figure 144 shows nucleic acid SEQ. ID No.: 287 and amino acid SEQ. ID. No.: 288.

Figure 145 shows nucleic acid SEQ. ID No.: 289 and amino acid SEQ. ID. No.: 290.

Figure 146 shows nucleic acid SEQ. ID No.: 291 and amino acid SEQ. ID. No.: 292.

15 Figure 147 shows nucleic acid SEQ. ID No.: 293 and amino acid SEQ. ID. No.: 294.

Figure 148 shows nucleic acid SEQ. ID No.: 295 and amino acid SEQ. ID. No.: 296.

20 Figure 149 shows nucleic acid SEQ. ID No.: 297 and amino acid SEQ. ID. No.: 298. Figure 151 shows a comparison of Sequence Groups.

Figure 152 illustrates alignment of full length clones.

Figure 153 shows a procedure used for cloning of cytochrome p450 cDNA fragments by PCR

25 Figure 154 shows nucleic acid SEQ. ID No.: 299 and amino acid SEQ. ID. No.: 300.

Figure 155 shows nucleic acid SEQ. ID No.: 301 and amino acid SEQ. ID. No.: 302.

30 Figure 156 shows nucleic acid SEQ. ID No.: 303 and amino acid SEQ. ID. No.: 304.

Figure 157 shows nucleic acid SEQ. ID No.: 305 and amino

acid SEQ. ID. No.: 306.

Figure 158 shows nucleic acid SEQ. ID No.: 307 and amino acid SEQ. ID. No.: 308.

Figure 159 shows nucleic acid SEQ. ID No.: 309 and amino acid SEQ. ID. No.: 310.

Figure 160 shows nucleic acid SEQ. ID No.: 311 and amino acid SEQ. ID. No.: 312.

Figure 161 shows nucleic acid SEQ. ID No.: 313 and amino acid SEQ. ID. No.: 314.

Figure 162 shows nucleic acid SEQ. ID No.: 315 and amino acid SEQ. ID. No.: 316.

Figure 163 shows probe set sequences of all clones on GeneChip.

## DETAILED DESCRIPTION

### DEFINITIONS

Unless defined otherwise, all technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this invention belongs. Singleton et al. (1994) Dictionary of Microbiology and Molecular Biology, second edition, John Wiley and Sons (New York) provides one of skill with a general dictionary of many of the terms used in this invention. All patents and publications referred to herein are incorporated by reference herein. For purposes of the present invention, the following terms are defined below.

"Enzymatic activity" is meant to include demethylation, hydroxylation, epoxidation, N-oxidation, sulfoxidation, N-, S-, and O- dealkylations, desulfation, deamination, and reduction of azo, nitro, and N-oxide groups. The term

"nucleic acid" refers to a deoxyribonucleotide or ribonucleotide polymer in either single- or double-stranded form, or sense or anti-sense, and unless otherwise limited, encompasses known analogues of natural nucleotides that hybridize to nucleic acids in a manner similar to naturally occurring nucleotides. Unless otherwise indicated, a particular nucleic acid sequence includes the complementary sequence thereof. The terms "operably linked", "in operable combination", and "in operable order" refer to functional linkage between a nucleic acid expression control sequence (such as a promoter, signal sequence, or array of transcription factor binding sites) and a second nucleic acid sequence, wherein the expression control sequence affects transcription and/or translation of the nucleic acid corresponding to the second sequence.

The term "recombinant" when used with reference to a cell indicates that the cell replicates a heterologous nucleic acid, expresses said nucleic acid or expresses a peptide, heterologous peptide, or protein encoded by a heterologous nucleic acid. Recombinant cells can express genes or gene fragments in either the sense or antisense form that are not found within the native (non-recombinant) form of the cell. Recombinant cells can also express genes that are found in the native form of the cell, but wherein the genes are modified and re-introduced into the cell by artificial means.

A "structural gene" is that portion of a gene comprising a DNA segment encoding a protein, polypeptide or a portion thereof, and excluding the 5' sequence which drives the initiation of transcription. The structural gene may

alternatively encode a nontranslatable product. The structural gene may be one which is normally found in the cell or one which is not normally found in the cell or cellular location wherein it is introduced, in which case it is termed a "heterologous gene". A heterologous gene may be derived in whole or in part from any source known to the art, including a bacterial genome or episome, eukaryotic, nuclear or plasmid DNA, cDNA, viral DNA or chemically synthesized DNA. A structural gene may contain one or more modifications that could effect biological activity or its characteristics, the biological activity or the chemical structure of the expression product, the rate of expression or the manner of expression control. Such modifications include, but are not limited to, mutations, insertions, deletions and substitutions of one or more nucleotides. The structural gene may constitute an uninterrupted coding sequence or it may include one or more introns, bounded by the appropriate splice junctions. The structural gene may be translatable or non-translatable, including in an anti-sense orientation. The structural gene may be a composite of segments derived from a plurality of sources and from a plurality of gene sequences (naturally occurring or synthetic, where synthetic refers to DNA that is chemically synthesized).

"Derived from" is used to mean taken, obtained, received, traced, replicated or descended from a source (chemical and/or biological). A derivative may be produced by chemical or biological manipulation (including, but not limited to, substitution, addition, insertion, deletion, extraction, isolation, mutation and replication) of the original source.

5 "Chemically synthesized", as related to a sequence of DNA, means that portions of the component nucleotides were assembled in vitro. Manual chemical synthesis of DNA may be accomplished using well established procedures (Caruthers, Methodology of DNA and RNA Sequencing, (1983), Weissman (ed.), Praeger Publishers, New York, Chapter 1); automated chemical synthesis can be performed using one of a number of commercially available machines.

10 Optimal alignment of sequences for comparison may be conducted by the local homology algorithm of Smith and Waterman, Adv. Appl. Math. 2:482 (1981), by the homology alignment algorithm of Needleman and Wunsch, J. Mol. Biol. 48:443 (1970), by the search for similarity method of Pearson  
15 and Lipman Proc. Natl. Acad. Sci. (U.S.A.) 85: 2444 (1988), by computerized implementations of these algorithms (GAP, BESTFIT, FASTA, and TFASTA in the Wisconsin Genetics Software Package, Genetics Computer Group, 575 Science Dr., Madison, Wis.), or by inspection.

20 The NCBI Basic Local Alignment Search Tool (BLAST) (Altschul et al., 1990) is available from several sources, including the National Center for Biological Information (NCBI, Bethesda, Md.) and on the Internet, for use in  
25 connection with the sequence analysis programs blastp, blastn, blastx, tblastn and tblastx. It can be accessed at <http://www.ncbi.nlm.nih.gov/BLAST/>. A description of how to determine sequence identity using this program is available at [http://www.ncbi.nlm.nih.gov/BLAST/blast\\_help.html](http://www.ncbi.nlm.nih.gov/BLAST/blast_help.html).

The terms "substantial amino acid identity" or "substantial amino acid sequence identity" as applied to amino acid sequences and as used herein denote a characteristic of a polypeptide, wherein the peptide comprises a sequence that has at least 70 percent sequence identity, preferably 80 percent amino acid sequence identity, more preferably 90 percent amino acid sequence identity, and most preferably at least 99 to 100 percent sequence identity as compared to a reference group over region corresponding to the first amino acid following the cytochrome p450 motif GXRXCX(G/A) to the stop codon of the translated peptide.

The terms "substantial nucleic acid identity" or "substantial nucleic acid sequence identity" as applied to nucleic acid sequences and as used herein denote a characteristic of a polynucleotide sequence, wherein the polynucleotide comprises a sequence that has at least 75 percent sequence identity, preferably 81 percent amino acid sequence identity, more preferably at least 91 percent sequence identity, and most preferably at least 99 to 100 percent sequence identity as compared to a reference group over region corresponding to the first nucleic acid following the cytochrome p450 motif GXRXCX(G/A) to the stop codon of the translated peptide.

Another indication that nucleotide sequences are substantially identical is if two molecules hybridize to each other under stringent conditions. Stringent conditions are sequence-dependent and will be different in different circumstances. Generally, stringent conditions are selected to be about 5°C to about 20°C, usually about 10°C to about 15°C,

lower than the thermal melting point ( $T_m$ ) for the specific sequence at a defined ionic strength and pH. The  $T_m$  is the temperature (under defined ionic strength and pH) at which 50% of the target sequence hybridizes to a matched probe. Typically, stringent conditions will be those in which the salt concentration is about 0.02 molar at pH 7 and the temperature is at least about 60°C. For instance in a standard Southern hybridization procedure, stringent conditions will include an initial wash in 6xSSC at 42 °C followed by one or more additional washes in 0.2xSSC at a temperature of at least about 55°C, typically about 60°C and often about 65°C.

Nucleotide sequences are also substantially identical for purposes of this invention when the polypeptides and/or proteins which they encode are substantially identical. Thus, where one nucleic acid sequence encodes essentially the same polypeptide as a second nucleic acid sequence, the two nucleic acid sequences are substantially identical, even if they would not hybridize under stringent conditions due to degeneracy permitted by the genetic code (see, Darnell et al. (1990) Molecular Cell Biology, Second Edition Scientific American Books W. H. Freeman and Company New York for an explanation of codon degeneracy and the genetic code). Protein purity or homogeneity can be indicated by a number of means well known in the art, such as polyacrylamide gel electrophoresis of a protein sample, followed by visualization upon staining. For certain purposes high resolution may be needed and HPLC or a similar means for purification may be utilized.

As used herein, the term "vector" is used in reference to

nucleic acid molecules that transfer DNA segment(s) into a cell. A vector may act to replicate DNA and may reproduce independently in a host cell. The term "vehicle" is sometimes used interchangeably with "vector." The term "expression  
5 vector" as used herein refers to a recombinant DNA molecule containing a desired coding sequence and appropriate nucleic acid sequences necessary for the expression of the operably linked coding sequence in a particular host organism. Nucleic acid sequences necessary for expression in prokaryotes usually  
10 include a promoter, an operator (optional), and a ribosome binding site, often along with other sequences. Eucaryotic cells are known to utilize promoters, enhancers, and termination and polyadenylation signals.

15 For the purpose of regenerating complete genetically engineered plants with roots, a nucleic acid may be inserted into plant cells, for example, by any technique such as in vivo inoculation or by any of the known in vitro tissue culture techniques to produce transformed plant cells that can  
20 be regenerated into complete plants. Thus, for example, the insertion into plant cells may be by in vitro inoculation by pathogenic or non-pathogenic *A. tumefaciens*. Other such tissue culture techniques may also be employed.

25 "Plant tissue" includes differentiated and undifferentiated tissues of plants, including, but not limited to, roots, shoots, leaves, pollen, seeds, tumor tissue and various forms of cells in culture, such as single cells, protoplasts, embryos and callus tissue. The plant tissue may  
30 be *in planta* or in organ, tissue or cell culture.

"Plant cell" as used herein includes plant cells in planta and plant cells and protoplasts in culture. "cDNA" or "complementary DNA" generally refers to a single stranded DNA molecule with a nucleotide sequence that is complementary to an RNA molecule. cDNA is formed by the action of the enzyme reverse transcriptase on an RNA template.

#### STRATEGIES FOR OBTAINING NUCLEIC ACID SEQUENCES

In accordance with the present invention, RNA was extracted from Nicotiana tissue of converter and non-converter Nicotiana lines. The extracted RNA was then used to create cDNA. Nucleic acid sequences of the present invention were then generated using two strategies.

In the first strategy, the poly A enriched RNA was extracted from plant tissue and cDNA was made by reverse transcription PCR. The single strand cDNA was then used to create p450 specific PCR populations using degenerate primers plus a oligo d(T) reverse primer. The primer design was based on the highly conserved motifs of p450. Examples of specific degenerate primers are set forth in Figure 1. Sequence fragments from plasmids containing appropriate size inserts were further analyzed. These size inserts typically ranged from about 300 to about 800 nucleotides depending on which primers were used.

In a second strategy, a cDNA library was initially constructed. The cDNA in the plasmids was used to create p450 specific PCR populations using degenerate primers plus T7 primer on plasmid as reverse primer. As in the first

strategy, sequence fragments from plasmids containing appropriate size inserts were further analyzed.

5 Nicotiana plant lines known to produce high levels of nornicotine (converter) and plant lines having undetectable levels of nornicotine may be used as starting materials.

10 Leaves can then be removed from plants and treated with ethylene to activate p450 enzymatic activities defined herein. Total RNA is extracted using techniques known in the art. cDNA fragments can then be generated using PCR (RT-PCR) with the oligo d(T) primer as described in Figure 153. The cDNA library can then be constructed more fully described in examples herein.

15 The conserved region of p450 type enzymes can be used as a template for degenerate primers (Figure 75). Using degenerate primers, p450 specific bands can be amplified by PCR. Bands indicative for p450 like enzymes can be identified  
20 by DNA sequencing. PCR fragments can be characterized using BLAST search, alignment or other tools to identify appropriate candidates.

25 Sequence information from identified fragments can be used to develop PCR primers. These primers in combination of plasmid primers in cDNA library were used to clone full length p450 genes. Large-scale Southern reverse analysis was conducted to examine the differential expression for all fragment clones obtained and in some cases full length clones.  
30 In this aspect of the invention, these large-scale reverse Southern assays can be conducted using labeled total cDNA's

from different tissues as a probe to hybridize with cloned DNA fragments in order to screen all cloned inserts.

Nonradioactive and radioactive ( $P^{32}$ ) Northern blotting assays were also used to characterize clones p450 fragments and full length clones.

Peptide specific antibodies were made against several full-length clones by deriving their amino acid sequence and selecting peptide regions that were antigenic and unique relative to other clones. Rabbit antibodies were made to synthetic peptides conjugated to a carrier protein. Western blotting analyses or other immunological methods were performed on plant tissue using these antibodies.

Nucleic acid sequences identified as described above can be examined by using virus induced gene silencing technology (VIGS, Baulcombe, Current Opinions in Plant Biology, 1999, 2:109-113).

Peptide specific antibodies were made for several full-length clones by deriving their amino acid sequence and selecting peptide regions that were potentially antigenic and were unique relative to other clones. Rabbit antibodies were made to synthetic peptides conjugated to a carrier protein. Western blotting analyses were performed using these antibodies.

In another aspect of the invention, interfering RNA technology (RNAi) is used to further characterize cytochrome p450 enzymatic activities in Nicotiana plants of the present

invention. The following references which describe this technology are incorporated by reference herein, Smith et al., Nature, 2000, 407:319-320; Fire et al., Nature, 1998, 391:306-311; Waterhouse et al., PNAS, 1998, 95:13959-13964; Stalberg et al., Plant Molecular Biology, 1993, 23:671- 683; Baulcombe, Current Opinions in Plant Biology, 1999, 2:109-113; and Brigneti et al., EMBO Journal, 1998, 17(22):6739-6746. Plants may be transformed using RNAi techniques, antisense techniques, or a variety of other methods described.

Several techniques exist for introducing foreign genetic material into plant cells, and for obtaining plants that stably maintain and express the introduced gene. Such techniques include acceleration of genetic material coated onto microparticles directly into cells (US Patents 4,945,050 to Cornell and 5,141,131 to DowElanco). Plants may be transformed using Agrobacterium technology, see US Patent 5,177,010 to University of Toledo, 5,104,310 to Texas A&M, European Patent Application 0131624B1, European Patent Applications 120516, 159418B1, European Patent Applications 120516, 159418B1 and 176,112 to Schilperoot, US Patents 5,149,645, 5,469,976, 5,464,763 and 4,940,838 and 4,693,976 to Schilperoot, European Patent Applications 116718, 290799, 320500 all to MaxPlanck, European Patent Applications 604662 and 627752 to Japan Nicotiana, European Patent Applications 0267159, and 0292435 and US Patent 5,231,019 all to Ciba Geigy, US Patents 5,463,174 and 4,762,785 both to Calgene, and US Patents 5,004,863 and 5,159,135 both to Agracetus. Other transformation technology includes whiskers technology, see U.S. Patents 5,302,523 and 5,464,765 both to Zeneca. Electroporation technology has also been used to transform

plants, see WO 87/06614 to Boyce Thompson Institute, 5,472,869 and 5,384,253 both to Dekalb, WO9209696 and WO9321335 both to PGS. All of these transformation patents and publications are incorporated by reference. In addition to numerous technologies for transforming plants, the type of tissue which is contacted with the foreign genes may vary as well. Such tissue would include but would not be limited to embryogenic tissue, callus tissue type I and II, hypocotyl, meristem, and the like. Almost all plant tissues may be transformed during dedifferentiation using appropriate techniques within the skill of an artisan.

Foreign genetic material introduced into a plant may include a selectable marker. The preference for a particular marker is at the discretion of the artisan, but any of the following selectable markers may be used along with any other gene not listed herein which could function as a selectable marker. Such selectable markers include but are not limited to aminoglycoside phosphotransferase gene of transposon Tn5 (Aph II) which encodes resistance to the antibiotics kanamycin, neomycin and G418, as well as those genes which code for resistance or tolerance to glyphosate; hygromycin; methotrexate; phosphinothricin (bar); imidazolinones, sulfonylureas and triazolopyrimidine herbicides, such as chlorosulfuron; bromoxynil, dalapon and the like.

In addition to a selectable marker, it may be desirable to use a reporter gene. In some instances a reporter gene may be used without a selectable marker. Reporter genes are genes which are typically not present or expressed in the recipient organism or tissue. The reporter gene typically encodes for

a protein which provide for some phenotypic change or enzymatic property. Examples of such genes are provided in K. Weising et al. Ann. Rev. Genetics, 22, 421 (1988), which is incorporated herein by reference. Preferred reporter genes include without limitation glucuronidase (GUS) gene and GFP genes.

Once introduced into the plant tissue, the expression of the structural gene may be assayed by any means known to the art, and expression may be measured as mRNA transcribed, protein synthesized, or the amount of gene silencing that occurs (see U.S. Patent No. 5,583,021 which is hereby incorporated by reference). Techniques are known for the in vitro culture of plant tissue, and in a number of cases, for regeneration into whole plants (EP Appln No. 88810309.0). Procedures for transferring the introduced expression complex to commercially useful cultivars are known to those skilled in the art.

Once plant cells expressing the desired level of p450 enzyme are obtained, plant tissues and whole plants can be regenerated therefrom using methods and techniques well-known in the art. The regenerated plants are then reproduced by conventional means and the introduced genes can be transferred to other strains and cultivars by conventional plant breeding techniques.

The following examples illustrate methods for carrying out the invention and should be understood to be illustrative of, but not limiting upon, the scope of the invention which is defined in the appended claims.

## EXAMPLES

### EXAMPLE I: DEVELOPMENT OF PLANT TISSUE AND ETHYLENE TREATMENT

#### Plant Growth

Plants were seeded in pots and grown in a greenhouse for 4 weeks. The 4 week old seedlings were transplanted into individual pots and grown in the greenhouse for 2 months. The plants were watered 2 times a day with water containing 150ppm NPK fertilizer during growth. The expanded green leaves were detached from plants to do the ethylene treatment described below.

#### Cell Line 78379

Tobacco line 78379, which is a burley tobacco line released by the University of Kentucky was used as a source of plant material. One hundred plants were cultured as standard in the art of growing tobacco and transplanted and tagged with a distinctive number (1-100). Fertilization and field management were conducted as recommended.

Three quarters of the 100 plants converted between 20 and 100% of the nicotine to nornicotine. One quarter of the 100 plants converted less than 5% of the nicotine to nornicotine. Plant number 87 had the least conversion (2%) while plant number 21 had 100% conversion. Plants converting less than 3% were classified as non-converters. Self-pollinated seed of

plant number 87 and plant number 21, as well as crossed (21 x 87 and 87 x 21) seeds were made to study genetic and phenotypic differences. Plants from selfed 21 were converters, and 99% of selfs from 87 were non-converters. The other 1% of the plants from 87 showed low conversion (5-15%). Plants from reciprocal crosses were all converters.

#### Cell Line 4407

Nicotiana line 4407, which is a burley line was used as a source of plant material. Uniform and representative plants (100) were selected and tagged. Of the 100 plants 97 were non-converters and three were converters. Plant number 56 had the least amount of conversion (1.2%) and plant number 58 had the highest level of conversion (96%). Self-pollenated seeds and crossed seeds were made with these two plants.

Plants from selfed-58 segregated with 3:1 converter to non-converter ratio. Plants 58-33 and 58-25, were identified as homozygous converter and nonconverter plant lines, respectively. The stable conversion of 58-33 was confirmed by analysis of its progenies of next generation.

Cell Line PBLB01

5 PBLB01 is a burley line developed by ProfiGen, Inc. and was used as a source of plant material. The converter plant was selected from foundation seeds of PBLB01.

Ethylene Treatment Procedures

10 Green leaves were detached from 2-3 month greenhouse grown plants and sprayed with 0.3% ethylene solution (Prep brand Ethephon (Rhone-Poulenc)). Each sprayed leaf was hung in a curing rack equipped with humidifier and covered with plastic. During the treatment, the sample leaves were  
15 periodically sprayed with the ethylene solution. Approximately 24-48 hour post ethylene treatment, leaves were collected for RNA extraction. Another sub-sample was taken for metabolic constituent analysis to determine the concentration of leaf metabolites and more specific constituents of interest such as  
20 a variety of alkaloids.

As an example, alkaloids analysis could be performed as follows. Samples (0.1 g) were shaken at 150 rpm with 0.5 ml 2N NaOH, and a 5 ml extraction solution which contained  
25 quinoline as an internal standard and methyl t-butyl ether. Samples were analyzed on a HP 6890 GC equipped with a FID detector. A temperature of 250°C was used for the detector and injector. An HP column (30m-0.32mm-1m) consisting of fused silica crosslinked with 5% phenol and 95% methyl silicon  
30 was used at a temperature gradient of 110-185 °C at 10°C per minute. The column was operated at 100°C with a flow rate of

1.7cm<sup>3</sup>min<sup>-1</sup> with a split ratio of 40:1 with a 2.1 injection volume using helium as the carrier gas.

#### EXAMPLE 2: RNA ISOLATION

5

For RNA extractions, middle leaves from 2 month old greenhouse grown plants were treated with ethylene as described. The 0 and 24-48 hours samples were used for RNA extraction. In some cases, leaf samples under the senescence process were taken from the plants 10 days post flower-head removal. These samples were also used for extraction. Total RNA was isolated using Rneasy Plant Mini Kit® (Qiagen, Inc., Valencia, California) following manufacturer's protocol.

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The tissue sample was ground under liquid nitrogen to a fine powder using a DEPC treated mortar and pestle. Approximately 100 milligrams of ground tissue were transferred to a sterile 1.5 ml eppendorf tube. This sample tube was placed in liquid nitrogen until all samples were collected.

20

Then, 450µl of Buffer RLT as provided in the kit (with the addition of Mercaptoethanol) was added to each individual tube. The sample was vortexed vigorously and incubated at 56° C for 3 minutes. The lysate was then, applied to the

25

QIAshredder™ spin column sitting in a 2-ml collection tube, and centrifuged for 2 minutes at maximum speed. The flow through was collected and 0.5 volume of ethanol was added to the cleared lysate. The sample is mixed well and transferred to an Rneasy® mini spin column sitting in a 2 ml collection tube. The sample was centrifuged for 1 minute at 10,000rpm.

30

Next, 700µl of buffer RW1 was pipetted onto the Rneasy® column

and centrifuged for 1 minute at 10,000rpm. Buffer RPE was pipetted onto the Rneasy® column in a new collection tube and centrifuged for 1 minute at 10,000 rpm. Buffer RPE was again, added to the Rneasy® spin column and centrifuged for 2 minutes at maximum speed to dry the membrane. To eliminate any ethanol carry over, the membrane was placed in a separate collection tube and centrifuged for an additional 1 minute at maximum speed. The Rneasy® column was transferred into a new 1.5 ml collection tube, and 40 µl of Rnase-free water was pipetted directly onto the Rneasy® membrane. This final elute tube was centrifuged for 1 minute at 10,000rpm. Quality and quantity of total RNA was analyzed by denatured formaldehyde gel and spectrophotometer.

Poly(A)RNA was isolated using Oligotex™ poly A+ RNA purification kit (Qiagen Inc.) following manufacture's protocol. About 200 µg total RNA in 250 µl maximum volume was used. A volume of 250µl of Buffer OBB and 15 µl of Oligotex™ suspension was added to the 250 µl of total RNA. The contents were mixed thoroughly by pipetting and incubated for 3 minutes at 70°C on a heating block. The sample was then, placed at room temperature for approximately 20 minutes. The oligotex:mRNA complex was pelleted by centrifugation for 2 minutes at maximum speed. All but 50 µl of the supernatant was removed from the microcentrifuge tube. The sample was treated further by OBB buffer. The oligotex:mRNA pellet was resuspended in 400 µl of Buffer OW2 by vortexing. This mix was transferred onto a small spin column placed in a new tube and centrifuged for 1 minute at maximum speed. The spin column

was transferred to a new tube and an additional 400 µl of Buffer OW2 was added to the column. The tube was then centrifuged for 1 minute at maximum speed. The spin column was transferred to a final 1.5ml microcentrifuge tube. The sample was eluted with 60 µl of hot (70°C) Buffer OEB. Poly A product was analyzed by denatured formaldehyde gels and spectrophotometric analysis.

### EXAMPLE 3: REVERSE TRANSCRIPTION-PCR

First strand cDNA was produced using SuperScript reverse transcriptase following manufacturer's protocol (Invitrogen, Carlsbad, California). The poly A+ enriched RNA/oligo dT primer mix consisted of less than 5 µg of total RNA, 1 µl of 10mM dNTP mix, 1 µl of Oligo d(T)<sub>12-18</sub> (0.5µg/µl), and up to 10 µl of DEPC-treated water. Each sample was incubated at 65°C for 5 minutes, then placed on ice for at least 1 minute. A reaction mixture was prepared by adding each of the following components in order: 2 µl 10X RT buffer, 4 µl of 25 mM MgCl<sub>2</sub>, 2µl of 0.1 M DTT, and 1 µl of RNase OUT Recombinant RNase Inhibitor. An addition of 9 µl of reaction mixture was pipetted to each RNA/primer mixture and gently mixed. It was incubated at 42°C for 2 minutes and 1 µl of Super Script II™ RT was added to each tube. The tube was incubated for 50 minutes at 42°C. The reaction was terminated at 70°C for 15 minutes and chilled on ice. The sample was collected by centrifugation and 1 µl of RNase H was added to each tube and incubated for 20 minutes at 37°C. The second PCR was carried out with 200 pmoles of forward primer (degenerate primers as in Figure

75, SEQ.ID Nos. 149-156) and 100 pmoles reverse primer (mix of 18nt oligo d(T) followed by 1 random base).

5        Reaction conditions were 94°C for 2 minutes and then performed 40 cycles of PCR at 94°C for 1 minute, 45° to 60°C for 2 minutes, 72°C for 3 minutes with a 72°C extension for an extra 10 min.

10        Ten microliters of the amplified sample were analyzed by electrophoresis using a 1% agarose gel. The correct size fragments were purified from agarose gel.

#### 15        EXAMPLE 4: GENERATION OF PCR FRAGMENT POPULATIONS

15        PCR fragments from Example 3 were ligated into a pGEM-T® Easy Vector (Promega, Madison, Wisconsin) following manufacturer's instructions. The ligated product was transformed into JM109 competent cells and plated on LB media plates for blue/white selection. Colonies were selected and grown in a 96 well plate with 1.2 ml of LB media overnight at 37°C. Frozen stock was generated for all selected colonies. Plasmid DNA from plates were purified using Beckman's Biomeck 2000 miniprep robotics with Wizard SV Miniprep® kit (Promega). Plasmid DNA was eluted with 100µl water and stored in a 96 well plate. Plasmids were digested by EcoR1 and were analyzed using 1% agarose gel to confirm the DNA quantity and size of inserts. The plasmids containing a 400-600 bp insert were sequenced using an CEQ 2000 sequencer (Beckman, Fullerton, California). The

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25

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sequences were aligned with GenBank database by BLAST search. The p450 related fragments were identified and further analyzed. Alternatively, p450 fragments were isolated from subtraction libraries. These fragments were also analyzed as described above.

#### EXAMPLE 5: CONSTRUCTION OF CDNA LIBRARY

A cDNA library was constructed by preparing total RNA from ethylene treated leaves as follows. First, total RNA was extracted from ethylene treated leaves of tobacco line 58-33 using a modified acid phenol and chloroform extraction protocol. Protocol was modified to use one gram of tissue that was ground and subsequently vortexed in 5 ml of extraction buffer (100 mM Tris-HCl, pH 8.5; 200 mM NaCl; 10mM EDTA; 0.5% SDS) to which 5 ml phenol (pH5.5) and 5 ml chloroform was added. The extracted sample was centrifuged and the supernatant was saved. This extraction step was repeated 2-3 more times until the supernatant appeared clear. Approximately 5 ml of chloroform was added to remove trace amounts of phenol. RNA was precipitated from the combined supernatant fractions by adding a 3-fold volume of ETOH and 1/10 volume of 3M NaOAc (pH5.2) and storing at -20°C for 1 hour. After transferring to a Corex glass container the RNA fraction was centrifuged at 9,000 RPM for 45 minutes at 4°C. The pellet was washed with 70% ethanol and spun for 5 minutes at 9,000 RPM at 4°C. After drying the pellet, the pelleted RNA was dissolved in 0.5 ml RNase free water. The pelleted RNA was dissolved in 0.5 ml RNase free water. The quality and quantity of total RNA was

analyzed by denatured formaldehyde gel and spectrophotometer, respectively.

5 The resultant total RNA was isolated for poly A+ RNA using an Oligo(dT) cellulose protocol (Invitrogen) and Microcentrifuge spin columns (Invitrogen) by the following protocol. Approximately twenty mg of total RNA was subjected to twice purification to obtain high quality poly A+ RNA. Poly A+ RNA product was analyzed by performing  
10 denatured formaldehyde gel and subsequent RT-PCR of known full-length genes to ensure high quality of mRNA.

Next, poly A+ RNA was used as template to produce a cDNA library employing cDNA synthesis kit, ZAP-cDNA®  
15 synthesis kit, and ZAP-cDNA® Gigapack® III gold cloning kit (Stratagene, La Jolla, California). The method involved following the manufacture's protocol as specified. Approximately 8 µg of poly A+ RNA was used to construct cDNA library. Analysis of the primary library revealed about 2.5  
20  $\times 10^6$  -  $1 \times 10^7$  pfu. A quality background test of the library was completed by complementation assays using IPTG and X-gal, where recombinant plaques was expressed at more than 100-fold above the background reaction.

25 A more quantitative analysis of the library by random PCR showed that average size of insert cDNA was approximately 1.2 kb. The method used a two-step PCR method as followed. For the first step, reverse primers were designed based on the preliminary sequence information  
30 obtained from p450 fragments. The designed reverse primers

and T3 (forward) primers were used amplify corresponding genes from the cDNA library. PCR reactions were subjected to agarose electrophoresis and the corresponding bands of high molecular weight were excised, purified, cloned and sequenced. In the second step, new primers designed from 5'UTR or the start coding region of p450 as the forward primers together with the reverse primers (designed from 3'UTR of p450) were used in the subsequent PCR to obtain full-length p450 clones.

The p450 fragments were generated by PCR amplification from the constructed cDNA library as described in Example 3 with the exception of the reverse primer. The T7 primer located on the plasmid downstream of cDNA inserts (see Figure 75) was used as a reverse primer. PCR fragments were isolated, cloned and sequenced as described in Example 4.

Full-length p450 genes were isolated by PCR method from constructed cDNA library. Gene specific reverse primers (designed from the downstream sequence of p450 fragments) and a forward primer (T3 on library plasmid) were used to clone the full length genes. PCR fragments were isolated, cloned and sequenced. If necessary, second step PCR was applied. In the second step, new forward primers designed from 5'UTR of cloned p450s together with the reverse primers designed from 3'UTR of p450 clones were used in the subsequent PCR reactions to obtain full-length p450 clones. The clones were subsequently sequenced.

EXAMPLE 6: CHARACTERIZATION OF CLONED FRAGMENTS - REVERSE SOUTHERN BLOTTING ANALYSIS

Nonradioactive large scale reverse southern blotting assays were performed on all p450 clones identified in above examples to detect the differential expression. It was observed that the level of expression among different p450 clusters was very different. Further real time detection was conducted on those with high expression.

Nonradioactive Southern blotting procedures were conducted as follows.

1) Total RNA was extracted from ethylene treated and nontreated converter (58-33) and nonconverter (58-25) leaves using the Qiagen Rnaeasy kit as described in Example 2.

2) Probe was produced by biotin-tail labeling a single strand cDNA derived from poly A+ enriched RNA generated in above step. This labeled single strand cDNA was generated by RT-PCR of the converter and nonconverter total RNA (Invitrogen) as described in Example 3 with the exception of using biotinylated oligo dT as a primer (Promega). These were used as a probe to hybridize with cloned DNA.

3) Plasmid DNA was digested with restriction enzyme EcoR1 and run on agarose gels. Gels were simultaneously dried and transferred to two nylon membranes (Biodyne B®). One membrane was hybridized with converter probe and the other with nonconverter probe. Membranes were UV-crosslinked

(auto crosslink setting, 254 nm, Stratagene, Stratalinker) before hybridization.

Alternatively, the inserts were PCR amplified from each  
5 plasmid using the sequences located on both arms of p-GEM  
plasmid, T3 and SP6, as primers. The PCR products were  
analyzed by running on a 96 well Ready-to-run agarose gels.  
The confirmed inserts were dotted on two nylon membranes.  
One membrane was hybridized with converter probe and the  
10 other with nonconverter probe.

4) The membranes were hybridized and washed following  
manufacture's instruction with the modification of washing  
stringency (Enzo MaxSence™ kit, Enzo Diagnostics, Inc,  
15 Farmingdale, NY). The membranes were prehybridized with  
hybridization buffer (2x SSC buffered formamide, containing  
detergent and hybridization enhancers) at 42°C for 30 min  
and hybridized with 10µl denatured probe overnight at 42°C.  
The membranes then were washed in 1X hybridization wash  
20 buffer 1 time at room temperature for 10 min and 4 times at  
68°C for 15 min. The membranes were ready for the  
detection.

5) The washed membranes were detected by alkaline  
25 phosphatase labeling followed by NBT/BCIP colometric  
detection as described in manufacture's detection procedure  
(Enzo Diagnostics, Inc.). The membranes were blocked for one  
hour at room temperature with 1x blocking solution, washed 3  
times with 1X detection reagents for 10 min, washed 2 times  
30 with 1x predevelopment reaction buffer for 5 min and then

developed the blots in developing solution for 30-45 min until the dots appear. All reagents were provided by manufacture (Enzo Diagnostics, Inc). In Addition, large scale reverse Southern assay was also performed using KPL southern hybridization and detection kit™ following manufacturer's instruction(KPL, Gaithersburg, Maryland).

EXAMPLE 7: CHARACTERIZATION OF CLONES - NORTHERN BLOT ANALYSIS

Alternative to Southern Blot analysis, some membranes were hybridized and detected as described in the example of Northern blotting assays. Northern Hybridization was used to detect mRNA differentially expressed in Nicotiana as follows.

A random priming method was used to prepare probes from cloned p450 (Megaprime™ DNA Labelling Systems, Amersham Biosciences).

The following components were mixed: 25ng denatured DNA template; 4ul of each unlabeled dTTP, dGTP and dCTP; 5ul of reaction buffer; P<sup>32</sup>-labelled dATP and 2ul of Klenow I; and H<sub>2</sub>O, to bring the reaction to 50ul. The mixture was incubated in 37°C for 1-4 hours, then stopped with 2ul of 0.5 M EDTA. The probe was denatured by incubating at 95°C for 5 minutes before use.

RNA samples were prepared from ethylene treated and non-treated fresh leaves of several pairs of tobacco lines. In some cases poly A<sup>+</sup> enriched RNA was used. Approximately 15µg total RNA or 1.8µg mRNA (methods of RNA and mRNA extraction as described in Example 5) were brought to equal volume with DEPC H<sub>2</sub>O (5-10 µl). The same volume of loading buffer (1 x MOPS; 18.5 % Formaldehyde; 50 % Formamide; 4 % Ficoll400; Bromophenolblue) and 0.5 µl EtBr (0.5 µg/µl) were added. The samples were subsequently denatured in preparation for separation of the RNA by electrophoresis.

Samples were subjected to electrophoresis on a formaldehyde gel (1 % Agarose, 1 x MOPS, 0.6 M Formaldehyde) with 1XMOP buffer (0.4 M Morpholinopropanesulfonic acid; 0.1 M Na-acetate-3 x H<sub>2</sub>O; 10 mM EDTA; adjust to pH 7.2 with NaOH). RNA was transferred to a Hybond-N<sup>+</sup> membrane (Nylon, Amersham Pharmacia Biotech) by capillary method in 10 X SSC buffer (1.5 M NaCl; 0.15 M Na-citrate) for 24 hours. Membranes with RNA samples were UV-crosslinked (auto crosslink setting, 254 nm, Stratagene, Stratalinker) before hybridization.

The membrane was prehybridized for 1-4 hours at 42°C with 5-10 ml prehybridization buffer (5 x SSC; 50 % Formamide; 5 x Denhardt's-solution; 1 % SDS; 100µg/ml heat-denatured sheared non- homologous DNA). Old prehybridization buffer was discarded, and new prehybridization buffer and probe were added. The hybridization was carried out over night at 42°C. The membrane was washed for 15 minutes with

2 x SSC at room temperature, followed by a wash with 2 x SSC.

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A major focus of the invention was the discovery of novel genes that may be induced as a result of ethylene treatment or play a key role in tobacco leaf quality and constituents. As illustrated in the table below, Northern blots and reverse Southern Blot were useful in determining which genes were induced by ethylene treatment relative to non-induced plants. Interestingly, not all fragments were affected similarly in the converter and nonconverter. The cytochrome p450 fragments of interest were partially sequenced to determine their structural relatedness. This information was used to subsequently isolate and characterize full length gene clones of interest.

Fragments	Induced mRNA Expression Ethylene Treatment
	Converter
D56-AC7 (SEQ ID No: 35)	+
D56-AG11 (SEQ ID No: 31)	+
D56-AC12 (SEQ ID No: 45)	+
D70A-AB5 (SEQ ID No: 95)	+
D73-AC9 (SEQ ID No: 43)	+
D70A-AA12 (SEQ ID No: 131)	+
D73A-AG3 (SEQ ID No: 129)	+
D34-52 (SEQ ID No: 61)	+
D56-AG6 (SEQ ID No: 51)	+

Northern analysis was performed using full length clones on tobacco tissue obtained from converter and nonconverter burley lines that were induced by ethylene treatment. The purpose was to identify those full length clones that showed elevated expression in ethylene induced converter lines relative to ethylene induced converter lines relative to ethylene induced nonconverter burley lines. By so doing, the functionality relationship of full length clones may be determined by comparing biochemical differences in leaf constituents between converter and nonconverter lines. As shown in table below, six clones showed significantly higher expression, as denoted by ++ and +++, in converter ethylene treated tissue than that of nonconverter treated tissue, denoted by +. All of these clones showed little or no expression in converter and nonconverter lines that were not ethylene treated.

Full Length Clones	Converter	Nonconverter
-----------------------	-----------	--------------

D101-BA2	++	+
D207-AA5	++	+
D208-AC8	+++	+
D237-AD1	++	+
D89-AB1	++	+
D90A-BB3	++	+

EXAMPLE 8: IMMUNODETECTION OF p450S ENCODED BY THE CLONED GENES

Peptide regions corresponding to 20-22 amino acids in length from three p450 clones were selected for 1) having lower or no homology to other clones and 2) having good hydrophilicity and antigenicity. The amino acid sequences of the peptide regions selected from the respective p450 clones are listed below. The synthesized peptides were conjugated with KHL and then injected into rabbits. Antisera were collected 2 and 4 weeks after the 4<sup>th</sup> injection (Alpha Diagnostic Intl. Inc. San Antonio, TX).

D234-AD1 DIDGSKSKLVKAHRKIDEILG  
D90a-BB3 RDAFREKETFDENDVEELNY  
D89-AB1 FKNNGDEDRHFSQKLGLDLADKY

Antisera were examined for crossreactivity to target proteins from tobacco plant tissue by Western Blot analysis. Crude protein extracts were obtained from ethylene treated (0 to 40 hours) middle leaves of converter and nonconverter lines. Protein concentrations of the extracts were

determined using RC DC Protein Assay Kit (BIO-RAD) following the manufacturer's protocol.

Two micrograms of protein were loaded onto each lane and the proteins separated on 10% - 20% gradient gels using the Laemmli SDS-PAGE system. The proteins were transferred from gels to PROTRAN® Nitrocellulose Transfer Membranes (Schleicher & Schuell) with the Trans-Blot® Semi-Dry cell (BIO-RAD). Target p450 proteins were detected and visualized with the ECL Advance™ Western Blotting Detection Kit (Amersham Biosciences). Primary antibodies against the synthetic-KLH conjugates were made in rabbits. Secondary antibody against rabbit IgG, coupled with peroxidase, was purchased from Sigma. Both primary and secondary antibodies were used at 1:1000 dilutions. Antibodies showed strong reactivity to a single band on the Western Blots indicating that the antisera were monospecific to the target peptide of interest. Antisera were also crossreactive with synthetic peptides conjugated to KLH.

#### EXAMPLE 9: NUCLEIC ACID IDENTITY AND STRUCTURE RELATEDNESS OF ISOLATED NUCLEIC ACID FRAGMENTS

Over 100 cloned p450 fragments were sequenced in conjunction with Northern blot analysis to determine their structural relatedness. The approach used utilized forward primers based either of two common p450 motifs located near the carboxyl-terminus of the p450 genes. The forward primers corresponded to cytochrome p450 motifs FXPERF or GRRXCP(A/G) as denoted in Figure 1. The reverse primers used standard primers from either the plasmid, SP6 or T7

located on both arms of pGEM™ plasmid, or a poly A tail.  
The protocol used is described below.

Spectrophotometry was used to estimate the  
5 concentration of starting double stranded DNA following the  
manufacturer's protocol (Beckman Coulter). The template was  
diluted with water to the appropriate concentration,  
denatured by heating at 95° C for 2 minutes, and  
subsequently placed on ice. The sequencing reaction was  
10 prepared on ice using 0.5 to 10µl of denatured DNA template,  
2 µl of 1.6 pmole of the forward primer, 8 µl of DTCS Quick  
Start Master Mix and the total volume brought to 20 µl with  
water. The thermocycling program consisted of 30 cycles of  
the follow cycle: 96° C for 20 seconds, 50° C for 20  
15 seconds, and 60° C for 4 minutes followed by holding at 4°  
C.

The sequence was stopped by adding 5 µl of stop buffer  
(equal volume of 3M NaOAc and 100mM EDTA and 1 µl of 20  
20 mg/ml glycogen). The sample was precipitated with 60 µl of  
cold 95% ethanol and centrifuged at 6000g for 6 minutes.  
Ethanol was discarded. The pellet was 2 washes with 200 µl  
of cold 70% ethanol. After the pellet was dry, 40 µl of SLS  
solution was added and the pellet was resuspended. A layer  
25 of mineral oil was over laid. The sample was then, placed  
on the CEQ 8000 Automated Sequencer for further analysis.

In order to verify nucleic acid sequences, nucleic acid  
sequence was re-sequenced in both directions using forward  
30 primers to the FXPERF or GRRXCP(A/G) region of the p450 gene

or reverse primers to either the plasmid or poly A tail. All sequencing was performed at least twice in both directions.

The nucleic acid sequences of cytochrome p450 fragments were compared to each other from the coding region corresponding to the first nucleic acid after the region encoding the GRRXCP(A/G) motif through to the stop codon. This region was selected as an indicator of genetic diversity among p450 proteins. A large number of genetically distinct p450 genes, in excess of 70 genes, were observed, similar to that of other plant species. Upon comparison of nucleic acid sequences, it was found that the genes could be placed into distinct sequences groups based on their sequence identity. It was found that the best unique grouping of p450 members was determined to be those sequences with 75% nucleic acid identity or greater (shown in Table I). Reducing the percentage identity resulted in significantly larger groups. A preferred grouping was observed for those sequences with 81% nucleic acid identity or greater, a more preferred grouping 91% nucleic acid identity or greater, and a most preferred grouping for those sequences 99% nucleic acid identity or greater. Most of the groups contained at least two members and frequently three or more members. Others were not repeatedly discovered suggesting that approach taken was able to isolated both low and high expressing mRNA in the tissue used.

Based on 75% nucleic acid identity or greater, two cytochrome p450 groups were found to contain nucleic acid sequence identity to previously tobacco cytochrome genes that genetically distinct from that within the group. Group

23, showed nucleic acid identity, within the parameters used for Table I, to prior GenBank sequences of GI:1171579 (CAA64635) and GI:14423327 (or AAK62346) by Czernic et al and Ralston et al, respectively. GI:1171579 had nucleic acid identity to Group 23 members ranging 96.9% to 99.5% identity to members of Group 23 while GI:14423327 ranged 95.4% to 96.9% identity to this group. The members of Group 31 had nucleic acid identity ranging from 76.7% to 97.8% identity to the GenBank reported sequence of GI:14423319 (AAK62342) by Ralston et al. None of the other p450 identity groups of Table 1 contained parameter identity, as used in Table 1, to Nicotiana p450s genes reported by Ralston et al, Czernic et al., Wang et al or LaRosa and Smigocki.

As shown in Figure 76, consensus sequence with appropriate nucleic acid degenerate probes could be derived for group to preferentially identify and isolate additional members of each group from Nicotiana plants.

Table I: Nicotiana p450 Nucleic Acid Sequence Identity Groups

<u>GROUP</u>	<u>FRAGMENTS</u>
5	
1	D58-BG7 (SEQ ID No.:1), D58-AB1 (SEQ ID No.:3); D58-BE4 (SEQ ID No.:7)
2	D56-AH7 (SEQ ID No.:9); D13a-5 (SEQ ID No.:11)
3	D56-AG10 (SEQ ID No.:13); D35-33 (SEQ ID No.:15);
10	D34-62 (SEQ ID No.:17)
4	D56-AA7 (SEQ ID No.:19); D56-AE1 (SEQ ID No.:21); 185-BD3 (SEQ ID No.:143)
5	D35-BB7 (SEQ ID No.:23); D177-BA7 (SEQ ID No.:25); D56A-AB6 (SEQ ID No.:27); D144-AE2 (SEQ ID No.:29)
15	6 D56-AG11 (SEQ ID No.:31); D179-AA1 (SEQ ID No.:33)
7	D56-AC7 (SEQ ID No.:35); D144-AD1 (SEQ ID No.:37)
8	D144-AB5 (SEQ ID No.:39)
9	D181-AB5 (SEQ ID No.:41); D73-Ac9 (SEQ ID No.:43)
10	D56-AC12 (SEQ ID No.:45)
20	11 D58-AB9 (SEQ ID No.:47); D56-AG9 (SEQ ID No.:49); D56-AG6 (SEQ ID No.:51); D35-BG11 (SEQ ID No.:53); D35-42 (SEQ ID No.:55); D35-BA3 (SEQ ID No.:57); D34-57 (SEQ ID No.:59); D34-52 (SEQ ID No.:61); D34-25 (SEQ ID No.:63)
12	D56-AD10 (SEQ ID No.:65)
25	13 56-AA11 (SEQ ID No.:67)
14	D177-BD5 (SEQ ID No.:69); D177-BD7 (SEQ ID No.:83)

15 D56A-AG10 (SEQ ID No.:71); D58-BC5 (SEQ ID No.:73);  
D58-AD12 (SEQ ID No.:75)

16 D56-AC11 (SEQ ID No.:77); D35-39 (SEQ ID No.:79);  
D58-BH4 (SEQ ID No.:81); D56-AD6 (SEQ ID No.:87) -

5 17 D73A-AD6 (SEQ ID No.:89); D70A-BA11 (SEQ ID No.:91)

18 D70A-AB5 (SEQ ID No.:95); D70A-AA8 (SEQ ID No.:97)

19 D70A-AB8 (SEQ ID No.:99); D70A-BH2 (SEQ ID No.:101);  
D70A-AA4 (SEQ ID No.:103)

20 D70A-BA1 (SEQ ID No.:105); D70A-BA9 (SEQ ID No.:107)

10 21 D70A-BD4 (SEQ ID No.:109)

22 D181-AC5 (SEQ ID No.:111); D144-AH1 (SEQ ID No.:113);  
D34-65 (SEQ ID No.:115)

23 D35-BG2 (SEQ ID No.:117)

24 D73A-AH7 (SEQ ID No.:119)

15 25 D58-AA1 (SEQ ID No.:121); D185-BC1 (SEQ ID No.:133);  
D185-BG2 (SEQ ID No.:135)

26 D73-AE10 (SEQ ID No.:123)

27 D56-AC12 (SEQ ID No.:125)

28 D177-BF7 (SEQ ID No.:127); D185-BE1 (SEQ ID No.:137);

20 D185-BD2 (SEQ ID No.:139)

29 D73A-AG3 (SEQ ID No.:129)

30 D70A-AA12 (SEQ ID No.:131); D176-BF2 (SEQ ID No.:85)

31 D176-BC3 (SEQ ID No.:145)

32 D176-BB3 (SEQ ID No.: 147)

25 33 D186-AH4 (SEQ ID No.:5)

EXAMPLE 10: RELATED AMINO ACID SEQUENCE IDENTITY OF  
ISOLATED NUCLEIC ACID FRAGMENTS

5           The amino acid sequences of nucleic acid sequences  
obtained for cytochrome p450 fragments from Example 8 were  
deduced. The deduced region corresponded to the amino acid  
immediately after the GXRSCP(A/G) sequence motif to the end  
of the carboxyl-terminus, or stop codon. Upon comparison of  
10       sequence identity of the fragments, a unique grouping was  
observed for those sequences with 70% amino acid identity or  
greater. A preferred grouping was observed for those  
sequences with 80% amino acid identity or greater, more  
preferred with 90% amino acid identity or greater, and a  
15       most preferred grouping for those sequences 99% amino acid  
identity of greater. The groups and corresponding amino  
acid sequences of group members are shown in Figure 2.  
Several of the unique nucleic acid sequences were found to  
have complete amino acid identity to other fragments and  
20       therefore only one member with the identical amino acid was  
reported.

          The amino acid identity for Group 19 of Table II  
corresponded to three distinct groups based on their nucleic  
25       acid sequences. The amino acid sequences of each group  
member and their identity is shown in Figure. 77. The amino  
acid differences are appropriated marked.

          At least one member of each amino acid identity group  
30       was selected for gene cloning and functional studies using  
plants. In addition, group members that are differentially

affected by ethylene treatment or other biological differences as assessed by Northern and Southern analysis were selected for gene cloning and functional studies. To assist in gene cloning, expression studies and whole plant evaluations, peptide specific antibodies will be prepared on sequence identity and differential sequence.

5

Table II: Nicotiana p450 Amino Acid Sequence Identity Groups

<u>GROUP</u>	<u>FRAGMENTS</u>
5	
1	D58-BG7 (SEQ ID No.:2), D58-AB1 (SEQ ID No.:4)
2	D58-BE4 (SEQ ID No.:8)
3	D56-AH7 (SEQ ID No.:10); D13a-5 (SEQ ID No.:12)
4	D56-AG10 (SEQ ID
10	No.:14); D34-62 (SEQ ID No.:18)
5	D56-AA7 (SEQ ID No.:20); D56-AE1 (SEQ ID No.:22); 185-
	BD3 (SEQ ID No.:144)
6	D35-BB7 (SEQ ID No.:24); D177-BA7 (SEQ ID No.:26);
	D56A-AB6 (SEQ ID No.:28); D144-AE2 (SEQ ID No.:30)
15	7 D56-AG11 (SEQ ID No.:32); D179-AA1 (SEQ ID No.:34)
8	D56-AC7 (SEQ ID No.:36); D144-AD1 (SEQ ID No.:38)
9	D144-AB5 (SEQ ID No.:40)
10	D181-AB5 (SEQ ID No.:42); D73-Ac9 (SEQ ID No.:44)
11	D56-AC12 (SEQ ID No.:46)
20	12 D58-AB9 (SEQ ID No.:48); D56-AG9 (SEQ ID No.:50); D56-
	AG6 (SEQ ID No.:52); D35-BG11 (SEQ ID No.:54); D35-42 (SEQ
	ID No.:56); D35-BA3 (SEQ ID No.:58); D34-57 (SEQ ID
	No.:60); D34-52 (SEQ ID No.:62)
13	D56AD10 (SEQ ID No.:66)
25	14 56-AA11 (SEQ ID No.:68)
15	D177-BD5 (SEQ ID No.:70); D177-BD7 (SEQ ID No.:84)

16 D56A-AG10 (SEQ ID No.:72); D58-BC5 (SEQ ID No.:74);  
D58-AD12 (SEQ ID No.:76)

17 D56-AC11 (SEQ ID No.:78); D56-AD6 (SEQ ID No.:88)

18 D73A-AD6 (SEQ ID No.:90:)

5 19 D70A-AB5 (SEQ ID No.:96); D70A-AB8 (SEQ ID No.:100);  
D70A-BH2 (SEQ ID No.:102); D70A-AA4 (SEQ ID No.:104); D70A-  
BA1 (SEQ ID No.:106); D70A-BA9 (SEQ ID No.:108)

20 D70A-BD4 (SEQ ID No.:110)

21 D181-AC5 (SEQ ID No.:112); D144-AH1 (SEQ ID No.:114);  
10 D34-65 (SEQ ID No.:116)

22 D35-BG2 (SEQ ID No.:118)

23 D73A-AH7 (SEQ ID No.:120)

24 D58-AA1 (SEQ ID No.:122); D185-BC1 (SEQ ID No.:134);  
D185-BG2 (SEQ ID No.:136)

15 25 D73-AE10 (SEQ ID No.:124)

26 D56-AC12 (SEQ ID No.:126)

27 D177-BF7 (SEQ ID No.:128); 185-BD2 (SEQ ID No.:140)

28 D73A-AG3 (SEQ ID No.:130)

29 D70A-AA12 (SEQ ID No.:132); D176-BF2 (SEQ ID No.:86)

20 30 D176-BC3 (SEQ ID No.:146)

31 D176-BB3 (SEQ ID No.:148)

32 D186-AH4 (SEQ ID No.:6)

EXAMPLE 11: RELATED AMINO ACID SEQUENCE IDENTITY OF FULL LENGTH CLONES

The nucleic acid sequence of full length Nicotiana genes cloned in Example 5 were deduced for their entire amino acid sequence. Cytochrome p450 genes were identified by the presence of three conserved p450 domain motifs, which corresponded to UXXRXXZ, PXRFXF or GXRXC at the carboxyl-terminus where U is E or K, X is any amino acid and Z is P, T, S or M. It was also noted that two of the clones appeared nearly complete but lacked the appropriate stop codon, D130-AA1 and D101-BA2, however but both contained all three p450 cytochrome domains. All p450 genes were characterized for amino acid identity using a BLAST program comparing their full length sequences to each other and to known tobacco genes. The program used the NCBI special BLAST tool (Align two sequences (b12seq), <http://www.ncbi.nlm.nih.gov/blast/b12seq/b12.html>). Two sequences were aligned under BLASTN without filter for nucleic acid sequences and BLASTP for amino acid sequences. Based on their percentage amino acid identity, each sequence was grouped into identity groups where the grouping contained members that shared at least 85% identity with another member. A preferred grouping was observed for those sequences with 90% amino acid identity or greater, a more preferred grouping had 95% amino acid identity or greater, and a most preferred grouping had those sequences 99% amino acid identity or greater. Using these criteria, 25 unique groups were identified and are depicted in Table III.

Within the parameters used for Table III for amino acid identity, three groups were found to contain greater than

85% or greater identity to known tobacco genes. Members of Group 5 had up to 96% amino acid identity for full length sequences to prior GenBank sequences of GI:14423327 (or AAK62346) by Ralston et al. Group 23 had up to 93% amino acid identity to GI:14423328 (or AAK62347) by Ralston et al. and Group 24 had 92% identity to GI:14423318 (or AAK62343) by Ralston et al.

Table III: Amino Acid Sequence Identity Groups of Full Length Nicotiana p450 Genes

- 1 D208-AD9 (SEQ. ID. No. 224); D120-AH4 (SEQ. ID. No. 180); D121-AA8 (SEQ. ID. No. 182), D122-AF10 (SEQ. ID. No. 184); D103-AH3 (SEQ. ID. No. 222); D208-AC8 (SEQ. ID. No. 218); D-235-ABI (SEQ. ID. No. 246)
- 2 D244-AD4 (SEQ. ID. No. 250); D244-AB6 (SEQ. ID. No. 274) ; D285-AA8; D285-AB9; D268-AE2 (SEQ. ID. No. 270)
- 3 D100A-AC3 (SEQ. ID. No. 168); D100A-BE2
- 4 D205-BE9 (SEQ. ID. No. 276); D205-BG9 (SEQ. ID. No. 202); D205-AH4 (SEQ. ID. No. 294)
- 5 D259-AB9 (SEQ. ID. No. 260) ; D257-AE4 (SEQ. ID. No. 268); D147-AD3 (SEQ. ID. No. 194)
- 6 D249-AE8 (SEQ. ID. No. 256); D-248-AA6 (SEQ. ID. No. 254)
- 7 D233-AG7 (SEQ. ID. No. 266; D224-BD11 (SEQ. ID. No. 240); DAF10
- 8 D105-AD6 (SEQ. ID. No. 172); D215-AB5 (SEQ. ID. No. 220); D135-AE1 (SEQ. ID. No. 190)
- 9 D87A-AF3 (SEQ. ID. No. 216), D210-BD4 (SEQ. ID. No. 262)

10 D89-AB1 (SEQ. ID. No. 150); D89-AD2 (SEQ. ID. No. 152);  
 163-AG11 (SEQ. ID. No. 198); 163-AF12 (SEQ. ID. No.  
 196)  
 11 D267-AF10 (SEQ. ID. No. 296); D96-AC2 (SEQ. ID. No.  
 5 160); D96-AB6 (SEQ. ID. No. 158); D207-AA5 (SEQ. ID.  
 No. 204); D207-AB4 (SEQ. ID. No. 206); D207-AC4 (SEQ.  
 ID. No. 208)  
 12 D98-AG1 (SEQ. ID. No. 164); D98-AA1 (SEQ. ID. No. 162)  
 13 D209-AA12 (SEQ. ID. No. 212); D209-AA11; D209-AH10  
 10 (SEQ. ID. No. 214); D209-AH12 (SEQ. ID. No. 232);  
 D90a-BB3 (SEQ. ID. No. 154)  
 14 D129-AD10 (SEQ. ID. No. 188); D104A-AE8 (SEQ. ID. No.  
 170)  
 15 D228-AH8 (SEQ. ID. No. 244); D228-AD7 (SEQ. ID. No.  
 241), D250-AC11 (SEQ. ID. No. 258); D247-AH1 (SEQ.  
 ID. No. 252)  
 16 D128-AB7 (SEQ. ID. No. 186) ; D243-AA2 (SEQ. ID. No.  
 248); D125-AF11 (SEQ. ID. No. 228)  
 17 D284-AH5 (SEQ. ID. No. 298); D110-AF12 (SEQ. ID. No.  
 20 176)  
 18 D221-BB8 (SEQ. ID. No. 234)  
 19 D222-BH4 (SEQ. ID. No. 236)  
 20 D134-AE11 (SEQ. ID. No. 230)  
 21 D109-AH8 (SEQ. ID. No. 174)  
 25 22 D136-AF4 (SEQ. ID. No. 278)  
 23 D237-AD1 (SEQ. ID. No. 226)  
 24 D112-AA5 (SEQ. ID. No. 178)  
 25 D283-AC1 (SEQ. ID. No. 272)

30 The full length genes were further grouped based on the  
 highly conversed amino acid homology between UXXRXXZ p450

domain and GXRXC p450 domain near the end the carboxyl-terminus. As shown in Figure 3, individual clones were aligned for their sequence homology between the conserved domains relative to each other and placed in distinct identity groups. In several cases, although the nucleic acid sequence of the clone was unique, the amino acid sequence for the region was identical. The preferred grouping was observed for those sequences with 90% amino acid identity or greater, a more preferred group had 95% amino acid identity or greater, and a most preferred grouping had those sequences 99% amino acid identity of greater. The final grouping was similar to that based on the percent identity for the entire amino acid sequence of the clones except for Group 17 (of Table III) which was divided into two distinct groups.

Within the parameters used for amino acid identity in Table IV, three groups were found to contain 90% or greater identity to known tobacco genes. Members of Group 5 had up to 93.4% amino acid identity for full length sequences to prior GenBank sequences of GI:14423326 (AAK62346) by Ralston et al. Group 23 had up to 91.8% amino acid identity to GI:14423328 (or AAK62347) by Ralston et al. and Group 24 had 98.8% identity to GI:14423318 (or AAK62342) by Ralston et al.

Table IV: Amino Acid Sequence Identity Groups of Regions  
between Conserved Domains of Nicotiana p450 Genes

1	1	D208-AD9 (SEQ. ID. No. 224); D120-AH4 (SEQ. ID. No.
5		180); D121-AA8 (SEQ. ID. No. 182), D122-AF10 (SEQ. ID. No. 184); D103-AH3 (SEQ. ID. No. 222); D208-AC8 (SEQ. ID. No. 218); D-235-ABI (SEQ. ID. No. 246)
	2	D244-AD4 (SEQ. ID. No. 250); D244-AB6 (SEQ. ID. No. 274) ; D285-AA8; D285-AB9; D268-AE2 (SEQ. ID. No. 270)
10	3	D100A-AC3 (SEQ. ID. No. 168); D100A-BE2
	4	D205-BE9 (SEQ. ID. No. 276); D205-BG9 (SEQ. ID. No. 202); D205-AH4 (SEQ. ID. No. 294)
	5	D259-AB9 (SEQ. ID. No. 260) ; D257-AE4 (SEQ. ID. No. 268); D147-AD3 (SEQ. ID. No. 194)
15	6	D249-AE8 (SEQ. ID. No. 256); D-248-AA6 (SEQ. ID. No. 254)
	7	D233-AG7 (SEQ. ID. No. 266; D224-BD11 (SEQ. ID. No. 240); DAF10
	8	D105-AD6 (SEQ. ID. No. 172); D215-AB5 (SEQ. ID. No. 220); D135-AE1 (SEQ. ID. No. 190)
20	9	D87A-AF3 (SEQ. ID. No. 216), D210-BD4 (SEQ. ID. No. 262)
	10	D89-AB1 (SEQ. ID. No. 150); D89-AD2 (SEQ. ID. No. 152); 163-AG11 (SEQ. ID. No. 198); 163-AF12 (SEQ. ID. No. 196)
25	11	D267-AF10 (SEQ. ID. No. 296); D96-AC2 (SEQ. ID. No. 160); D96-AB6 (SEQ. ID. No. 158); D207-AA5 (SEQ. ID. No. 204); D207-AB4 (SEQ. ID. No. 206); D207-AC4 (SEQ. ID. No. 208)
30	12	D98-AG1 (SEQ. ID. No. 164); D98-AA1 (SEQ. ID. No. 162)

13 D209-AA12 (SEQ. ID. No. 212); D209-AA11; D209-AH10  
 (SEQ. ID. No. 214); D209-AH12 (SEQ. ID. No. 232);  
 D90a-BB3 (SEQ. ID. No. 154)  
 14 D129-AD10 (SEQ. ID. No. 188); D104A-AE8 (SEQ. ID. No.  
 5 170)  
 15 D228-AH8 (SEQ. ID. No. 244); D228-AD7 (SEQ. ID. No.  
 241), D250-AC11 (SEQ. ID. No. 258); D247-AH1 (SEQ.  
 ID. No. 252)  
 16 D128-AB7 (SEQ. ID. No. 186) ; D243-AA2 (SEQ. ID. No.  
 10 248); D125-AF11 (SEQ. ID. No. 228)  
 17 D284-AH5 (SEQ. ID. No. 298); D110-AF12 (SEQ. ID. No.  
 176)  
 18 D221-BB8 (SEQ. ID. No. 234)  
 19 D222-BH4 (SEQ. ID. No. 236)  
 15 20 D134-AE11 (SEQ. ID. No. 230)  
 21 D109-AH8 (SEQ. ID. No. 174)  
 22 D136-AF4 (SEQ. ID. No. 278)  
 23 D237-AD1 (SEQ. ID. No. 226)  
 24 D112-AA5 (SEQ. ID. No. 178)  
 20 25 D283-AC1 (SEQ. ID. No. 272)  
 26 D110-AF12 (SEQ. ID. No. 176)

EXAMPLE 12: NICOTIANA CYTOCHROME P450 CLONES LACKING ONE OR  
 MORE OF THE TOBACCO CYTOCHROME P450 SPECIFIC DOMAINS

25 Four clones had high nucleic acid homology, ranging 90%  
 to 99% nucleic acid homology, to other tobacco cytochrome  
 genes reported in Table III. The four clones included D136-  
 AD5, D138-AD12, D243-AB3 and D250-AC11. However, due to a  
 30 nucleotide frameshift these genes did not contain one or  
 more of three C-terminus cytochrome p450 domains and were

excluded from identity groups presented in Table III or Table IV.

The amino acid identity of one clone, D95-AG1, did not contain the third domain, GXRXC, used to group p450 tobacco genes in Table III or Table IV. The nucleic acid homology of this clone had low homology to other tobacco cytochrome genes. This clone represents a novel and different group of cytochrome p450 genes in Nicotiana.

EXAMPLE 13: USE OF NICOTIANA CYTOCHROME P450 FRAGMENTS AND CLONES IN ALTERED REGULATION OF TOBACCO PROPERTIES

The use of tobacco p450 nucleic acid fragments or whole genes are useful in identifying and selecting those plants that have altered tobacco phenotypes or tobacco constituents and, more importantly, altered metabolites. Transgenic tobacco plants are generated by a variety of transformation systems that incorporate nucleic acid fragments or full length genes, selected from those reported herein, in orientations for either down-regulation, for example anti-sense orientation, or over-expression for example, sense orientation. For over-expression to full length genes, any nucleic acid sequence that encodes the entire or a functional part or amino acid sequence of the full-length genes described in this invention are desired that are effective for increasing the expression of a certain enzyme and thus resulting in phenotypic effect within Nicotiana. Nicotiana lines that are homozygous lines are obtained through a series of backcrossing and assessed for phenotypic changes including, but not limited to, analysis of

endogenous p450 RNA, transcripts, p450 expressed peptides and concentrations of plant metabolites using techniques commonly available to one having ordinary skill in the art. The changes exhibited in the tobacco plants provide  
5 information on the functional role of the selected gene of interest or are of a utility as a preferred Nicotiana plant species.

EXAMPLE 14. IDENTIFICATION OF GENES INDUCED IN ETHYLENE TREATED  
10 CONVERTER LINES

High density oligonucleotide array technology, Affymetrix GeneChip® (Affymetrix Inc., Santa Clara, CA) array, was used for quantitative and highly parallel measurements of gene  
15 expression. In using this technology, nucleic acid arrays were fabricated by direct synthesis of oligonucleotides on a solid surface. This solid-phase chemistry is able to produce arrays containing hundreds of thousands of oligonucleotide probes packed at extremely high densities on a chip referred  
20 to as GeneChip®. Thousands of genes can be simultaneously screened from a single hybridization. Each gene is typically represented by a set of 11-25 pairs of probes depending upon size. The probes are designed to maximize sensitivity, specificity, and reproducibility, allowing consistent  
25 discrimination between specific and background signals, and between closely related target sequences.

Affymetrix GeneChip hybridization experiments involve the following steps: design and production of arrays, preparation of fluorescently labeled target from RNA isolated from the biological specimens, hybridization of the labeled target to the GeneChip, screening the array, and analysis of the scanned image and generation of gene expression profiles.

#### A. Designing and Custom making Affymetrix GeneChip

A GeneChip CustomExpress Advantage Array was custom made by Affymetrix Inc. (Santa Clara, CA). Chip size was 18 micron and array format was 100-2187 that can accommodate 528 probe sets (11, 628 probes). Except for GenBank derived nucleic acid sequences, all sequences were selected from our previously identified tobacco clones and all probes were custom designed. A total of 400 tobacco genes or fragments were selected to be included on the GeneChip. The sequences of oligonucleotides selected were based on unique regions of the 3' end of the gene. The selected nucleic acid sequences consisted of 56 full length p450 genes and 71 p450 fragments that were cloned from tobacco, described in (patent applications). Other tobacco sequences included 270 tobacco ESTs which were generated from suppression subtraction library using Clontech SSH kit (BD Biosciences, Palo Alto, CA). Among these genes, some oligonucleotide sequences were selected from cytochrome P450 genes listed in GenBank. Up to 25 probes were used for each full length gene and 11 probes for each fragment. A reduced number of probes were used for some clones due to the lack of unique, high quality probes. Appropriate control sequences were also included on the GeneChip®.

The probe Arrays were 25-mer oligonucleotides that were directly synthesized onto a glass wafer by a combination of semiconductor-based photolithography and solid phase chemical synthesis technologies. Each array contained up to 100,000 different oligonucleotide probes. Since oligonucleotide probes are synthesized in known locations on the array, the hybridization patterns and signal intensities can be interpreted in terms of gene identity and relative expression levels by the Affymetrix Microarray Suite® software. Each probe pair consists of a perfect match oligonucleotide and a mismatch oligonucleotide. The perfect match probe has a sequence exactly complimentary to the particular gene and thus measures the expression of the gene. The mismatch probe differs from the perfect match probe by a single base substitution at the center base position, which disturbs the binding of the target gene transcript. The mismatch produces a nonspecific hybridization signal or background signal that was compared to the signal measured for the perfect match oligonucleotide.

#### B. Sample preparation

Hybridization experiments were conducted by Genome Explorations, Inc. (Memphis, TN). The RNA samples used in hybridization consisted of six pairs of nonconverter/converter isogenic lines that were induced by ethylene treatments. Samples included one pair of 4407-25/4407-33 non-treated burly tobacco samples, three pairs of ethylene treated 4407-25/4407-

33 samples, one pair of ethylene treated dark tobacco NL Madole/181 and one pair of ethylene treated burly variety PBLB01/178. Ethylene treatment was as described in Example 1.

5           Total RNA was extracted from above mentioned ethylene treated and non-treated leaves using a modified acid phenol and chloroform extraction protocol. Protocol was modified to use one gram of tissue that was ground and subsequently vortexed in 5 ml of extraction buffer (100 mM Tris-HCl, pH 8.5; 200 mM NaCl; 10mM EDTA; 0.5% SDS) to which 5 ml phenol (pH5.5) and 5 ml chloroform was added. The extracted sample was centrifuged and the supernatant was saved. This extraction step was repeated 2-3 more times until the supernatant appeared clear. Approximately 5 ml of chloroform was added to remove trace amounts of phenol. RNA was precipitated from the combined supernatant fractions by adding a 3-fold volume of ETOH and 1/10 volume of 3M NaOAc (pH5.2) and storing at -20°C for 1 hour. After transferring to a Corex glass container the RNA fraction was centrifuged at 9,000 RPM for 45 minutes at 4°C. The pellet was washed with 70% ethanol and spun for 5 minutes at 9,000 RPM at 4°C. After drying the pellet, the pelleted RNA was dissolved in 0.5 ml RNase free water. The quality and quantity of total RNA was analyzed by denatured formaldehyde gel and spectrophotometer, respectively. The total RNA samples with 3-5µg/ul were sent to Genome explorations, inc. to do the hybridization.

C. Hybridization, detection and data output

The preparation of labeled cRNA material was performed as follows. First and second strand cDNA were synthesized from 5-15 µg of total RNA using the SuperScript Double-Stranded cDNA Synthesis Kit (Gibco Life Technologies) and oligo-dT24-T7 (5'-GGC CAG TGA ATT GTA ATA CGA CTC ACT ATA GGG AGG CCG-3') primer according to the manufacturer's instructions.

The cRNA was concurrently synthesized and labeled with biotinylated UTP and CTP by in vitro transcription using the T7 promoter coupled double stranded cDNA as template and the T7 RNA Transcript Labeling Kit (ENZO Diagnostics Inc.). Briefly, double stranded cDNA synthesized from the previous steps were washed twice with 70% ethanol and resuspended in 22 µl Rnase-free H<sub>2</sub>O. The cDNA was incubated with 4 µl of 10X each Reaction Buffer, Biotin Labeled Ribonucleotides, DTT, Rnase Inhibitor Mix and 2 µl 20X T7 RNA Polymerase for 5 hr at 37°C. The labeled cRNA was separated from unincorporated ribonucleotides by passing through a CHROMA SPIN-100 column (Clontech) and precipitated at -20°C for 1 hr to overnight.

Oligonucleotide array hybridization and analysis were performed as follows. The cRNA pellet was resuspended in 10 µl Rnase-free H<sub>2</sub>O and 10.0 µg was fragmented by heat and ion-mediated hydrolysis at 95°C for 35 mins in 200 mM Tris-acetate, pH 8.1, 500 mM KOAc, 150 mM MgOAc. The fragmented cRNA was hybridized for 16hr at 45°C to HG\_U95Av2 oligonucleotide arrays (Affymetrix) containing ~12,500 full length annotated genes together with additional probe sets designed to represent EST sequences. Arrays were washed at 25°C with 6 X SSPE (0.9M NaCl, 60 mM NaH<sub>2</sub>PO<sub>4</sub>, 6 mM EDTA + 0.01% Tween 20) followed by a stringent wash at 50°C with 100 mM

MES, 0.1M [Na+], 0.01% Tween 20. The arrays were stained with phycoerythrin conjugated streptavidin (Molecular Probes) and the fluorescence intensities were determined using a laser confocal scanner (Hewlett-Packard). The scanned images were analyzed using Microarray software (Affymetrix). Sample loading and variations in staining were standardized by scaling the average of the fluorescent intensities of all genes on an array to constant target intensity (250) for all arrays used. Data Analysis was conducted using Microarray Suite 5.0 (Affymetrix) following user guidelines. The signal intensity for each gene was calculated as the average intensity difference, represented by  $[\sum(PM - MM) / (\text{number of probe pairs})]$ , where PM and MM denote perfect-match and mismatch probes.

#### D. Data Analysis and results

Twelve sets of hybridizations were successful as evidenced by the Expression Report generated using detection instruments from Genome Explorations. The main parameters on the report included Noise, Scale factor, background, total probe sets, number and percentage of present and absent probe sets, signal intensity of housekeeping controls. The data was subsequently analyzed and presented using software GCOS in combination of other Microsoft software. Signal comparison between treatment pairs was analyzed. Overall data for all respective probes corresponding to genes and fragments of each different treatment including replications were compiled and compiled expression data such as call of the changes and signal log 2 ratio changes were analyzed.

A typical application of GeneChip technology is finding genes that are differentially expressed in different tissues. In the present application, genetic expression variations caused by ethylene treatment were determined for pairs of converter and nonconverter tobacco lines that included a 4407-25/4407-33 burley variety, PBLB01/178 burley variety, and a NL Madole/181 dark variety. These analyses detected only those genes whose expression is significantly altered due to biological variation. These analyses employed the Fold change (signal ratio) as a major criterion to identify induced genes. Other parameters, such as signal intensity, present/absent call, were also taken into consideration.

After analyzing the data for expression differences in converter and nonconverter pairs of samples for approximately 400 genes, the results based on the signal intensities showed that only two genes, D121-AA8 and D120-AH4, had reproducible induction in ethylene treated converter lines versus non-converter lines. To illustrate the differential expression of these genes, the data was represented as follows. As shown in Table V, the signal of a gene in a converter line, for example, burley tobacco variety, 4407-33, was determined as ratio to the signal of a related nonconverter isogenic line, 4407-25. Without ethylene treatment, the ratio of converter to nonconverter signals for all genes approached 1.00. Upon ethylene treatment, two genes, D121-AA8 and D120-AH4, were induced in converter lines relative to non-converter line as determined by three independent analyses using isogenic burley lines. These genes have very high homology to each other, approximately 99.8% or greater nucleic acid sequence homology. As depicted in Table V, their relative hybridization signals

in converter varieties ranged from approximately 2 to 12 fold higher in converter lines than the signals in their non-converter counterparts. In comparison, two actin-like control clones, internal controls, were found not to be induced in converter lines based on their normalized ratios. In addition, a fragment (D35-BG11), whose sequence in coding region is entirely contained in both D121-AA8 and D120-AH4 genes, was highly induced in the same samples of paired isogenic converter and nonconverter lines. Another isogenic pair of burley tobacco varieties, PBLB01 and 178, was shown to have the same genes, D121-AA8 and D120-AH4, induced in converter samples under ethylene induction. Furthermore, D121-AA8 and D120-AH4 genes were preferentially induced in converter lines of isogenic dark tobacco pairs, NL Madole and 181, demonstrating that ethylene induction of these genes in converter lines was not limited to burley tobacco varieties. In all cases, the D35-BG11 fragment was the most highly induced in converter relative to nonconverter paired lines.

Table V: A Comparison of Clone Induction in Ethylene Treated Converter and Non-Converter Lines

Clones	No Treatment	Ethylene Treated Burley Exp 1		Ethylene Treated Burley Exp 2		Ethylene Treated Burley Exp 3		Ethylene Treated Dark	
	33:25 Ratio	33:25 Ratio	Et:No Ratio	33:25 Ratio	Et:No Ratio	33:25 Ratio	Et:No Ratio	181:NL Ratio	Et:No Ratio
<i>Induced</i>									
D121-AA8	1.03	2.20	2.14	13.25	12.90	5.31	5.15	17.06	16.60
D120-AH4	1.44	2.74	1.90	18.33	12.74	4.13	2.87	11.76	8.17
<i>Control</i>									
Actin-Like I	1.18	1.17	0.99	0.88	0.74	0.86	0.73	1.20	1.02
Actin-Like I	1.09	1.23	1.12	0.89	0.81	1.18	0.11	1.02	0.93

EXAMPLE 15: CLONING RELATD D35-BG11 FULL LENGTH GENES

GeneChip hybridization was based on 3' reverse transcription (cRNA). The probes were synthesized on GeneChip were chosen from the 3' end of the genes (in the downstream 1000 nucleotide region). Therefore, in order to obtain all the possible variations of D121-AA8 and D120-AH4 clones, additional cloning was performed from the tobacco cDNA library using 5' sequences.

The full length genes were cloned from cDNA library constructed from 4407-33 ethylene treated tissue as described in Example 5. The Polymerase Chain Reaction method was used as follows. The reverse primers were designed based on the 3' sequence (including part of untranslated region) the D121-AA8 gene. The primer of D121-p2 5'-AGC AAG ATG ATC TTA GGT TTT AA-3' and D121-R-2 5'-CAA GCA AGA TGA TCT TAG GTT TTA ATA AAG CTC AGG T-3'. The T3 primer (5'CAA TTA ACC CTC ACT AAA GGG 3'), located in upstream of the inserts in the plasmid, was

used as forward primer. The generated PCR products were subjected to agarose electrophoresis and the corresponding bands of high molecular weight were excised, purified, cloned and sequenced. The methods for cloning and sequencing were described in Example 4. Nine novel clones were sequenced and identified as D425-AB10, D425-AB11, D425-AC9, D425-AC10, D425-AC11, D425-AG11, D425-AH7, D425-AH11, and D427-AA5. Each of the clones was observed to have 99% or greater nucleic acid sequence homology with clones D121-AA8 and D120-AH4.

EXAMPLE 16: ETHYLENE INDUCTION OF MICROSOMAL NICOTINE DEMETHYLASE IN TOBACCO CONVERTER LINES

Biochemical analyses of demethylase enzymatic activity in microsomal enriched fractions of ethylene treated and non-treated pairs of converter and non-converter tobacco lines was performed as follows.

A. Preparation of Microsomes

Microsomes were isolated at 4°C. Tobacco leaves were extracted in a buffer consisting of 50 mM N-(2-hydroxyethyl) piperazine-N'-(2-ethanesulfonic acid) (HEPES), pH 7.5, 3 mM DL-Dithiothreitol (DTT) and Protease Inhibitor Cocktail (Roche) at 1 tablet/50 ml. The crude extract was filtered through four layers of cheesecloth to remove undisrupted tissue, and the filtrate was centrifuged for 20 min at 20,000 x g to remove cellular debris. The supernatant was subjected to ultracentrifugation at 100,000 x g for 60 min and the resultant pellet contained the microsomal fraction. The

microsomal fraction was suspended in the extraction buffer and applied to an ultracentrifugation step where a discontinuous sucrose gradient of 0.5 M sucrose in the extraction buffer was used. The purified microsomes were resuspended in the extraction buffer supplemented with 10% (w/v) glycerol as cryoprotectant. Microsomal preparations were stored in a liquid nitrogen freezer until use.

#### B. Protein Concentration Determination

Microsomal proteins were precipitated with 10% Trichloroacetic Acid (TCA) (w/v) in acetone, and the protein concentrations of microsomes were determined using RC DC Protein Assay Kit (BIO-RAD) following the manufacturer's protocol.

### 3. Nicotine Demethylase Activity Assay

DL-Nicotine (Pyrrolidine-2-<sup>14</sup>C) was obtained from Moravsek Biochemicals and had a specific activity of 54 mCi/mmol. Chlorpromazine (CPZ) and oxidized cytochrome c (cyt. C), both P450 inhibitors, were purchased from Sigma. Reduced form of nicotinamide adenine dinucleotide phosphate (NADPH) is the typical electron donor for cytochrome P450 via the NADPH:cytochrome P450 reductase. NADPH was omitted for control incubation. Routine enzyme assay consisted of microsomal proteins (around 2 mg/ml), 6 mM NADPH, 55  $\mu$ M <sup>14</sup>C labeled nicotine. The concentration of CPZ and Cyt. C, when used, was 1 mM and 100  $\mu$ M, respectively. The reaction was carried at 25°C for 1 hour and was stopped with addition of 300  $\mu$ l

methanol to each 25  $\mu$ l reaction mixture. After spinning, 20  $\mu$ l of the methanol extract was separated with a reverse-phase High Performance Liquid Chromatography (HPLC) system (Agilent) using an Inertsil ODS-3 3 $\mu$  (150 x 4.6 mm) column from Varian. The isocratic mobile phase was the mixture of methanol and 50 mM potassium phosphate buffer, pH 6.25, with ratio of 60:40 (v/v) and the flow rate was 1 ml/min. The nornicotine peak, as determined by comparison with authentic non-labeled nornicotine, was collected and subjected to 2900 tri-carb Liquid Scintillation Counter (LSC) (Perkin Elmer) for quantification. The activity of nicotine demethylase is calculated based on the production of  $^{14}$ C labeled nornicotine over 1 hour incubation.

Samples were obtained from pairs of Burley converter (line 4407-33) and non-converter (line 4407-25) tobacco lines that were ethylene treated or not. All untreated samples did not have any detectable microsomal nicotine demethylase activity. In contrast, microsomal samples obtained from ethylene treated converter lines were found to contain significant levels of nicotine demethylase activity. The nicotine demethylase activity was shown to be inhibited by P450 specific inhibitors demonstrating the demethylase activity was consistent to a P450 microsomal derived enzyme. A typical set of enzyme assay results obtained for the burley converter tobacco line is shown in the Table VI. In contrast, sample derived from ethylene treated nonconverter tobacco did not contain any nicotine demethylase activity. These results demonstrated that nicotine demethylase activity was induced upon treatment with ethylene in converter lines but not in the

corresponding isogenic nonconverter line. Similar results were obtained for an isogenic dark tobacco variety pair, where microsomal nicotine demethylase activity was induced in converter lines and not detectable in nonconverter paired lines. Together these experiments demonstrated that microsomal nicotine demethylase activity is induced upon ethylene treatment in converter lines while not in paired isogenic nonconverter lines. Those genes that are P450 derived genes and are preferentially induced in converter lines relative to paired non-converter lines are candidate genes to encode the nicotine demethylase enzyme.

Table VI: DEMETHYLASE ACTIVITY IN MICROSOMES OF ETHYLENE INDUCED BURLEY CONVERTER AND NON CONVERTER LINES

Sample	Microsomes	Microsomes + 1 mM chlor- promazine	Microsomes + with 100 $\mu$ M cytochrome C	Microsomes - NADPH
Converter	0.6 $\pm$ 0.05 pkat / mg	0.01 $\pm$ 0.01 pkat / mg	0.03 $\pm$ 0.05 pkat / mg	0.03 $\pm$ 0.04 pkat / mg
Non- Converter	Not Detected	Not Detected	Not Detected	Not Detected

Numerous modifications and variations in practice of the invention are expected to occur to those skilled in the art upon consideration of the foregoing detailed description of the invention. Consequently, such modifications and variations are intended to be included within the scope of the following claims.

**WHAT IS CLAIMED IS:**

- 5       1.    An isolated nucleic acid molecule from *Nicotiana* wherein  
          said nucleic acid molecule comprising a nucleic acid  
          sequence selected from the group consisting of SEQ. ID. No.  
          299 through SEQ. ID. No. 357.
- 10       2.    A transgenic plant, wherein said transgenic plant comprises  
          the nucleic acid molecule of Claim 1.
3.    The transgenic plant of Claim 24, wherein said plant is a  
          tobacco plant.
- 15       4.    A method of producing a transgenic plant, wherein said  
          method comprises the steps of:
  - (i)   operably linking said nucleic acid molecule of any one of  
          the Claim 1 with a promoter functional in said plant to  
          create a plant transformational vector;
  - 20   (ii)   transforming said plant with said plant transformational  
          vector of step;
  - (iii)   selecting a plant cell transformed with said transformation  
          vector; and
  - (iv)   regenerating a transformation plant from said transformed  
25   plant cell.
5.    The method of Claim 4, wherein said nucleic acid molecule is  
          in an antisense orientation.
- 30       6.    The method of Claim 4, wherein said nucleic acid molecule is  
          in a sense orientation.

7. The method of Claim 4, wherein said nucleic acid molecule is in a RNA interference orientation.
8. The method of Claim 4, wherein said nucleic acid molecule is expressed as a double stranded RNA molecule.
9. The method of Claim 4, wherein said double stranded RNA molecule is about 15 to 25 nucleotides in length.
10. The method of Claim 4, wherein said transgenic plant is a tobacco plant.
11. A method of selecting a plant containing a nucleic acid molecule, wherein said plant is analyzed for the presence of nucleic acid sequence selected from the group consisting of 299 through 357.
12. The method of selecting a plant of Claim 11, wherein said plant is analyzed by DNA hybridization.
13. The method of selecting a plant of Claim 11, wherein said DNA hybridization is Southern blot analysis.
14. The method of selecting a plant of Claim 11 wherein said DNA hybridization is Northern blot analysis.
15. The method of selecting a plant of Claim 11, wherein said plant is analyzed by PCR detection.
16. The method of Claim 11, wherein said plant is a tobacco plant.

17. A method of increasing or decreasing nornicotine levels in a plant, wherein said method comprises the steps of:

5 (i) operably linking said nucleic acid molecule of claim 1 with a promoter functional in said plant to create a plant transformational vector;

(ii) transforming said plant with said plant transformational vector of step (i);

10 (iii) selecting a plant cell transformed with said transformation vector; and

(iv) regenerating a transformation plant from said transformed plant cell.

15 18. The method of Claim 17, wherein said nucleic acid molecule is in an antisense orientation.

19. The method of Claim 17, wherein said nucleic acid molecule is in a sense orientation.

20 21. The method of Claim 17, wherein said nucleic acid molecule is in a RNA interference orientation.

22. The method of Claim 17, wherein said nucleic acid molecule is expressed as a double stranded RNA molecule.

25 23. The method of Claim 17, wherein said transgenic plant is a tobacco plant.

SEQ ID 1                    D58-BG7  
1 GCACAACTT GCTATCAACT TGGTCACATC TATGTTGGGT  
61 CATTTGTTGC ATCATTTTAC ATGGGCTCCG GCCCCGGGGG TTAACCCGGA GGATATTGAC  
121 TTGGAGGAGA GCCCTGGAAC AGTAACTTAC ATGAAAAATC CAATACAAGC TATTCCAAC  
181 CCAAGATTGC CTGCACACTT GTATGGACGT GTGCCAGTGG ATATGTAA

SEQ ID 2  
AQLAINLVTSMLGHLHHTWAPAPGVNPEIDLEESPGTVTYMKNPIQAIPTPRLPAHLYGRVPVDM

FIG. 2

SEQ ID 3                    D58-AB1  
1 GCACAACT TGCTATCAAC TTGGTCACAT CTATGTTGGG  
61 TCATTGTTG CATCATTTTA CGTGGGCTCC GCCCCGGGGG GTTAACCCGG AGAATATTGA  
121 CTTGGAGGAG AGCCCTGGAA CAGTAACTTA CATGAAAAAT CCAATACAAG CTATTCCTAC  
181 TCCAAGATTG CCTGCACACT TGTATGGACG TGTGCCAGTG GATATGTAA

SEQ ID 4  
AQLAINLVTSMLGHLHHTWAPPPGVNPNIDLEESPGTVTYMKNPIQAIPTPRLPAHLYGRVPVDM

FIG. 3

SEQ ID 5                    D186-AH4  
1 ATGAATTAT TCATTGCAAG TGGAACACCT TTCAATTGCT  
61 CATATGATCC AAGGTTTCAG TTTTGCAACT ACGACCAATG AGCCTTTGGA TATGAAACAA  
121 GGTGTGGGTT TAACTTTACC AAAGAAGACT GATGTTGAAG TGCTAATTAC ACCTCGCCTT  
181 CCTCCTACGC TTTATCAATA TTAA

SEQ ID 6  
MNYSLQVEHLSIAHMIQGFSAFTTNEPLDMKQGVGLTLPKKT DVEVLITPRLPPTLYQY

FIG. 4

SEQ ID 7                    D58-BE4  
1 GCACAACTT GCTATCAACT TGGTCACATC TATGTTGGGT  
61 CATTTGTTCA TCATTTTACA TGGGCTCCGG CCCCCGGGGT TAACCCGGAG GATATTGACT  
121 TGGAGGAGAG CCCTGGAACA GTAACCTTACA TGA

SEQ ID 8  
AQLAINLVTSMLGHLFIILHGLRPRGLTRRILTWRRALEQ

FIG. 5

SEQ ID 9                    D56-AH7  
1 GAAGGATTG GCTGTTCGAA TGGTTGCCTT GTCATTGGGA  
61 TGTATTATTC AATGTTTTGA TTGGCAACGA ATCGGCGAAG AATTGGTTGA TATGACTGAA  
121 GGAAGTGGAC TTAATTTGCC TAAAGCTCAA CCTTGTGTGG CCAAGTGTAG CCCACGACCT  
181 AAAATGGCTA ATCTTCTCTC TCAGATTGA

SEQ ID 10  
EGLAVRMVALSLGCIIQCFDWQRIGEELVDMTEGTGLTLPKAQPLVAKCSPRPKMANLLSQI

**SEQ ID 11 D13a-5**

1 GAAGGATTG GCTATTCGAA TGGTTGCATT GTCATTGGGA  
61 TGTATTATTC AATGCTTTGA TTGGCAACGA CTTGGGGAAG GATTGGTTGA TAAGACTGAA  
121 GGAAGTGGAC TTAAGCTCAA CCTTTAGTGG CCAAGTGTAG CCCACGACCT  
181 ATAATGGCTA ATCTTCTTTC TCAGATT**TGA**

**SEQ ID 12**

EGLAIRMVALSLGCI IQCFDWQRLGEGLVDKTEGTGLTLPKAQPLVAKCSRPIMANLLSQI

**FIG. 7****SEQ ID 13 D56-AG10**

1 ATAGGTTTT GCGACTTTAG TGACACATCT GACTTTTGGT  
61 CGCTTGCTTC AAGGTTTTGA TTTTAGTAAG CCATCAAACA CGCCAATTGA CATGACAGAA  
121 GGCGTAGGCG TTAAGTTAAT CAAGTTGAAG TTCTAATTAC CCCTCGTTTA  
181 CCTTCTAAGC TTTATTTATT **TGA**

**SEQ ID 14**

IGFATLVTHLTFGRLLQGFD FSKPSNTPIDMTEGVGVTL PKVNQVEVLITPRLPSKLYLF

**FIG. 8****SEQ ID 15 D35-33**

1 ATAGGCTTT GCGACTTTAG TGACACATCT GACTTTTGGT  
61 CGCTTGCTTC AAGGTTTTGA TTTTAGTAAG CCATCAAACA CGCCAATTGA CATGACAGAA  
121 GGCGTAGGCG TTAAGTTAAT CAAGTTGAAG TTCTAATTAC CCCTCGTTTA  
181 CCTTCTAAGC TTTATTTAT

**SEQ ID 16**

IGFATLVTHLTFGRLLQGFD FSKPSNTPIDMTEGVGVTL PKVNQVEVLITPRLPSKLYL

**FIG. 9****SEQ ID 17 D34-62**

1 ATAAATTTT GCGACTTTAG TGACACATCT GACTTTTGGT  
61 CGCTTGCTTC AAGGTTTTGA TTTTAGTACG CCATCAAACA CGCCAATAGA CATGACAGAA  
121 GGCGTAGGCG TTAAGTTAAT CAAGTTGAAG TTCTAATTAG CCCTCGTTTA  
181 CCTTCTAAGC TTTATGTATT **CTGA**

**SEQ ID 18**

INFATLVTHLTFGRLLQGFD FSTPSNTPIDMTEGVGVTL PKVNQVEVLISPRLPSKLYVF

**FIG. 10****SEQ ID 19 D56AA7**

1 ATTATACTT GCATTGCCAA TTCTTGGCAT CACTTTGGGA  
61 CGTTTGGTTC AGAAGTTTGA GCTGTTGCCT CCTCCAGGCC AGTCGAAGCT CGACACCACA  
121 GAGAAAGTG GACAGTTCAG TCTCCACATT TTGAAGCATT CCACCATTGT GTTGAAACCA  
181 AGGTCTTTCT **GA**

**SEQ ID 20**

IILALPILGITLGRVLVQNFELLPPPGQSKLDTTEKGGQFSLHILKHSTIVLKPRSF

**SEQ ID 21 D56-AE1**

1 ATTATACTT GCATTGCCAA TTCTTGGCAT TACTTTGGGA  
 61 CGTTTGGTTC AGAACTTTGA GCTGTTGCCT CCTCCAGGCC AGTCGAAGCT CGACACCACA  
 121 GAGAAAGGTG GACAGTTCAG TCTCCATATT TTGAAGCATT CCACCATTGT GTTGAAACCA  
 181 AGGTCTTGCT GA

**SEQ ID 22**

IIILALPILGITLGRVLVQNFELLPPPGQSKLDTTEKGGQFSLHILKHSTIVLKPRSC

**FIG. 12****SEQ ID 23 D35-BB7**

1 TATTGCACTT GGGGTTGCAT CAATGGAAC TGCATTGTCA  
 61 AATCTTCTTT ATGCATTTGA TTGGGAGTTA CCTTTTGGAA TGAAGAAAGA AGACATTGAC  
 121 ACAAACGCCA GGCCTGGAAT TACCATGCAT AAGAAAAACG AACTTTATCT TATCCCTAAA  
 181 AATTATCTAT AG

**SEQ ID 24**

IALGVASMELALSNLLYAFDWELPFGMKKEDIDTNARPGITMHKKNELYLIPKNVLP SKLYLF

**FIG. 13****SEQ ID 25 D177-BA7**

1 ATTGCACTTG GGGTTGCATC CATGGAAC TT  
 121 GCTTTGTCAA ATCTTCTTTA TGCATTTGAT TGGGAGTTAC CTTACGGAGT GAAAAAAGAA  
 181 AACATTGACA CAAATGTCAG GCCTGGAATT ACCATGCATA AGAAAAACGA ACTTTGCCTT  
 241 ATCCCTAGAA ATTATCTATA G

**SEQ ID 26**

IALGVASMELALSNLLYAFDWELPYGVKKENIDTNVRPGITMHKKNELCLIPRNYL

**FIG. 14****SEQ ID 27 D56A-AB6**

1 GGTATTGCAC TTGGGGTTGC ATCCATGGAA CTTGCTTTGT CAAATCTTCT TTATGCATTT  
 61 GATTGGGAGT TGCCTTATGG AGTGAAAAAA GAAGACATCG ACACAAACGT TAGGCCTGGA  
 121 ATTGCCATGC ACAAGAAAAA CGAACTTTGC CTTGTCCCAA AAAATTATTT ATAA

**SEQ ID 28**

IALGVASMELALSNLLYAFDWELPYGVKKEDIDTNVRPGIAMHKKNELCLVPKNYL

**FIG. 15****SEQ ID 29 D144-AE2**

1 ATT GCACTTGGGG TTGCATCCAT GGAAC TTGCT  
 61 TTGTCAAATC TTCTTTATGC ATTTGATTGG GAGTTGCCTT ATGGAGTGAA AAAAGAAGAC  
 121 ATCGACACAA ACGTTAGGCC TGGAA TTGCC ATGCACAAGA AAAACGAACT TTGCCTTGTC  
 181 CCAAAAAAAT TATTTATAAA TTATATTGGG ACGTGGATCT CATGCTAG

**SEQ ID 30**

IALGVASMELALSNLLYAFDWELPYGVKKEDIDTNVRPGIAMHKKNELCLVPKKLFINYIGTWISC

**SEQ ID 31 D56-AG11**

1 ATTTTCGTTT GGTTTAGCTA ATGCTTATTT GCCATTGGCT  
 61 CAATTACTTT ATCACTTTGA TTGGGAACTC CCCACTGGAA TCAAACCAAG CGACTTGGAC  
 121 TTGACTGAGT TGGTTGGAGT AACTGCCGCT AGAAAAAGTG ACCTTTACTT GGTGCGACT  
 181 CCTTATCAAC CTCCTCAAAA CTGA

**SEQ ID 32**

ISFGLANAYLPLAQLLYHFDWELPTGIKPSDLDLTELVGVTAAARKSDLYLVATPYQPPQN

**FIG. 17****SEQ ID 33 D179-AA1**

1 ATTTTCGTTT GGCTTAGCTA ATGCTTATTT GCCATTGGCT  
 61 CAATTACTAT ATCACTTCGA TTGGGAACTC CCTGCTGGAA TCGAACCAAG CGACTTGGAC  
 121 TTGACTGAGT TGGTTGGAGT AACTGCCGCT AGAAAAAGTG ACCTTTACTT GGTGCGACT  
 181 CCTTATCAAC CTCCTCAAAA GTGA

**SEQ ID 34**

ISFGLANAYLPLAQLLYHFDWKLPAGIEPSDLDLTELVGVTAAARKSDLYLVATPYQPPQK

**FIG. 18****SEQ ID 35 D56-AC7**

1 ATGCTATTT GGTTTAGCTA ATGTTGGACA ACCTTTAGCT  
 61 CAGTTACTTT ATCACTTCGA TTGGGAACTC CCTAATGGAC AAAGTCATGA GAATTTTCGAC  
 121 ATGACTGAGT CACCTGGAAT TTCTGCTACA AGAAAGGATG ATCTTGTTTT GATTGCCACT  
 181 CCTTATGATT CTTATTAATTCCAGTCTA TATCATCTAT ATGTACTCAA TAATTGTATG  
 361 GGA

**SEQ ID 36**

MLFGLANVGQPLAQLLYHFDWKLPNGQSHENFDMTESPGISATRKDDLVLIAATPYDSY

**FIG. 19****SEQ ID 37 D144-AD1**

1 ATGC TATTTGGTTT AGCTAATGTT  
 61 GGACAACCTT TAGCTCAGTT ACTTTATCAC TTCGATTGGA AACTCCCTAA TGGACAAACT  
 121 CACCAAAATT TCGACATGAC TGAGTCACCT GGAATTTCTG CTACAAGAAA GGATGATCTT  
 181 ATTTTGATTG CCACTCCTGC TCATTCTTGA

**SEQ ID 38**

MLFGLANVGQPLAQLLYHFDWKLPNGQTHQNFDMTESPGISATRKDDLILIAATPAHS

**FIG. 20****SEQ ID 39 D144-AB5**

1 TTAT TATTCGGTTT AGTTAATGTA  
 61 GGACATCCTT TAGCTCAATT GCTTTATCAC TTCGATTGGA AGACTCTTCC TGGGATAAGT  
 121 TCAGATAGTT TCGACATGAC TGAAACAGAT GGAGTAACTG CCGGAAGAAA GGATGATCTT  
 181 TGTTTAATTG CTACTCCTTT TGGTCTCAAT TAA

**SEQ ID 40**

LLFGLVNVGHPLAQLLYHFDWKTLPGISSDSFDMTETDGVTAGRKDDLCLIAATPFGLN

## FIG. 21

## SEQ ID 41 D181-AB5

1 A TGTCGTTTGG TTTAGTTAAC ACTGGGCATC CTTTAGCTCA  
 61 GTTGCTCTAT TTCTTTGACT GGAAATCCCT TCATAAGGTT AATGCAGCTG ATTTTCACAC  
 121 TACTGAAACA AGTAGAGTTT TTGCAGCAAG CAAAGATGAC CTCTACTTGA TTCCAACAAA  
 181 TCACATGGAG CAAGAGTAG

## SEQ ID 42

MSFGLVNTGHPLAQLLYFFDWKFPKVNADFHTTETSRVFAASKDDLYLIPTNHMEQE

## FIG. 22

## SEQ ID 43 D73-AC9

1 AT GTCGTTTGGT TTAGTTAACA CAGGGCATCC TTTAGCCCAG  
 121 TTGCTCTATT GCTTTGACTG GAAACTCCCT GACAAGGTTA ATGCAAATGA TTTTCGCACT  
 181 ACTGAAACAA GTAGAGTTTT TGCAGCAAGC AAAGATGACC TCTACTTGAT TCCCACAAAT  
 241 CACAGGGAGC AAGAATAG

## SEQ ID 44

MSFGLVNTGHPLAQLLYCFDWKLDPKVNANDFRTTETSRVFAASKDDLYLIPTNHREQE

## FIG. 23

## SEQ ID 45 D56-AC12

1 ATGCAATTT GGT TTGGCTC TTGTTACTCT GCCATTGGCT  
 61 CATTTGCTTC ACAATTTTGA TTGGAACTT CCCGAAGGAA TTAATGCAAG GGATTGCGAC  
 121 ATGACAGAGG CAAATGGGAT ATCTGCTAGA AGAGAAAAAG ATCTTTACTT GATTGCTACT  
 181 CCTTATGTAT CACCTCTTGA TTAA

## SEQ ID 46

MQFGLALVTLPLAHLHNFWDWKLPEGINARDLDMTEANGISARREKDLYLIATPYVSPLD

## FIG. 24

## SEQ ID 47 D58-AB9

1 ATGACTTAT GCATTGCAAG TGGAACACCT AACAATGGCA  
 61 CATTTGATCC AGGGTTTCAA TTACAGAACT CCAACTGATG AGCCCTTGGA TATGAAAGAA  
 121 GGTGCAGGCA TAACTATACG TAAGGTAAAT CCTGTGAAAG TGATAATTAC GCCTCGCTTG  
 181 GCACCTGAGC TTTATTAA

## SEQ ID 48

MTYALQVEHLTMAHLIQGFNYRTPDEPLDMKEGAGITIRKVNVPVKVIITPRLAPELY

## FIG. 25

## SEQ ID 49 D56-AG9

1 ATGACTTAT GCATTGCAAG TGGAACACCT AACAATGGCA  
 61 CATTTAATCC AGGGTTTCAA TTACAAAACCT CCAAATGACG AGGCCTTGGA TATGAAGGAA  
 121 GGTGCAGGCA TAACTATACG TAAGGTAAAT CCTGTGGAAC TGATAATAGC GCCTCGCCTG  
 181 GCACCTGAGC TTTATTAA

## SEQ ID 50

MTYALQVEHLTMAHLIQGFNYKTPNDEALDMKEGAGITIRKVNVELIIPRLAPELY

**SEQ ID 51 D56-AG6**

1 ATGACTTAT GCATTGCAAG TGGAACACCT AACAATGGCA  
 61 CATTTAATCC AGGGTTTCAA TTACAAAACCT CCAAATGACG AGGCCTTGGA TATGAAGGAA  
 121 GGTGCAGGCA TAACAATACG TAAGGTAAAT CCAGTGGAAT TGATAATAAC GCCTCGCTTG  
 181 GCACCTGAGC TTTACTAA

**SEQ ID 52**

MTYALQVEHLTMAHLIQGFNYKTPNDEALDMKEGAGITIRKVNPFVELIITPRLAPELY

**FIG. 27****SEQ ID 53 D35-BG11**

1 ATGACTTAT GCATTGCAAG TGGAACACTT AACAATGGCA  
 61 CATTTGATCC AAGGTTTCAA TTACAGAACT CCAAATGACG AGCCCTTGGA TATGAAGGAA  
 121 GGTGCAGGCA TAACTATACG TAAGGTAAAT CCTGTGGAAC TGATAATAGC GCCTCGCCTG  
 181 GCACCTGAGC TTTATTAA

**SEQ ID 54**

MTYALQVEHLTMAHLIQGFNYRTPNDEPLDMKEGAGITIRKVNPFVELIIPRLAPELY

**FIG. 28****SEQ ID 55 D35-42**

1 ATGACTTAT GCATTGCAAG TGGAACACTT AACAATGGCA  
 61 CATTTGATCC AAGGTTTCAA TTACAGAACT CCAAATGACG AGCCCTTGGA TATGAAGGAA  
 121 GGTGCAGGCA TAACTATACG TAAGGTAAAT CCTGTGGAAC TGATAATAGC GCCCCTGGCA  
 181 CCTGAGCTTT ATTAA

**SEQ ID 56**

MTYALQVEHLTMAHLIQGFNYRTPNDEPLDMKEGAGITIRKVNPFVELIIPRLAPELY

**FIG. 29****SEQ ID 57 D35-BA3**

1 ATGACTTAT GCATTGCAAG TGGAACACTT AACAATGGCA  
 61 CATTTGATCC AAGGTTTCAA TTACAGAACT CCAAATGACG AGCCCTTGGA TATGAAGGAA  
 121 GGTGCAGGCA TAACTATACG TAAGGTAAAT CCTGCGGAAC TGATAATAGC GCCTCGCCTG  
 181 GCACCTGAGC TTTATTAA

**SEQ ID 58**

MTYALQVEHLTMAHLIQGFNYRTPNDEPLDMKEGAGITIRKVNPAELIIPRLAPELY

**FIG. 30****SEQ ID 59 D34-57**

1 ATGACTTAT GCATTACAAG TGGAACACCT AACAATAGCA  
 61 CATTTGATCC AGGGTTTCAA TTACAAAACCT CCAAATGACG AGCCCTTGGA TATGAAGGAA  
 121 GGTGCAGGAT TAACCATACG TAAAGTAAAT CCTGTAGAAG TGACAACTAC GGCTCGCCTG  
 181 GCACCTGAGC TTTATTAA

**SEQ ID 60**

MTYALQVEHLTIAHLIQGFNYKTPNDEPLDMKEAGLTIRKVNPFVETTTARLAPELY

**SEQ ID 61** **D34-52**

1 ATGACTTAT GCATTACAAG TGGAACACCT AACAAATAGCA  
 61 CATTTGATCC AGGGTTTCAA TTACAAAACCT CCAAATGACG AGCCCTTGGA TATGAAGGAA  
 121 GGTGCAGGAT TAACTATACG TAAAGTAAAT CCTGTAGAAG TGACAATTAC GGCTCGCCTG  
 181 GCACCTGAGC TTTATTAA

**SEQ ID 62**

MTYALQVEHLTIAHLIQGFNYKTPNDEPLDMKEGAGLTIRKVNPFVEVTITARLAPELY

**FIG. 32****SEQ ID 63** **D34-25**

1 ATGACTTAT GCATTACAAG TGGAACACCT AACAAATAGCA  
 61 CATTTGATCC AGGGTTTCAA TTACAAAACCT CCAAATGACG AGCCCTTGGA TATGAAGGAA  
 121 GGTGCAGGAT TAACTATACG TAAAGTAAAT CCTGTAGAAG TGACAATTAC GGCTCGCCTG  
 181 GCACCTGAGC TTTATTAA

**SEQ ID 64**

MTYALQVEHLTIAHLIQGFNYKTPNDEPLDMKEGAGLTIRKVNPFVEVTITARLAPELY

**FIG. 33****SEQ ID 65** **D56AD10**

1 TATAGCCTT GGACTTAAGG TTATCCGAGT AACATTAGCC  
 61 AACATGTTGC ATGGATTCAA CTGGAAATTA CCTGAAGGTA TGAAGCCAGA AGATATAAGT  
 121 GTGGAAGAAC ATTATGGGCT CACTACACAT CCTAAGTTTC CTGTTCTGT GATCTTGGAA  
 181 TCTAGACTTT CTTCAGATCT CTATTCCCCC ATCACTTAA

**SEQ ID 66**

YSLGLKVIRVTLANMLHGFNWKLPEGMKPEDISVEEHYGLTTHPKFPVPVILESRLSSDLYSPIT

**FIG. 34****SEQ ID 67** **D56-AA11**

1 ATACAGTCTT GGGATTCGTA TAATTAGGGC AACTTTAGCT  
 61 AACTTGTTGC ATGGATTCAA CTGGAGATTG CCTAATGGTA TGAGTCCAGA AGACATTAGC  
 121 ATGGAAGAGA TTTATGGGCT AATTACACAC CCCAAAGTCG CACTTGACGT GATGATGGAG  
 181 CCTCGACTTC CCAACCATCT TTACAAATAG

**SEQ ID 68**

YSLGIRIIRATLANLLHGFNWRLPNGMSPEDISMEEIYGLITHPKVALDVMMEPRLPNHLYK

**FIG. 35****SEQ ID 69** **D177-BD5**

1 ATTAATTTTT CAATACCACT TGTTGAGCTT  
 121 GCACTTGCTA ATCTATTGTT TCATTATAAT TGGTCACTTC CTGAAGGGAT GCTAGCTAAG  
 181 GATGTTGATA TGGAAGAAGC TTTGGGGATT ACCATGCACA AGAAATCTCC CCTTTGCTTA  
 241 GTAGCTTCTC ATTATACTTG TTGA

**SEQ ID 70**

INFSIPLVELALANLLFHYNWSLPEGMLAKDVDMEELGITMHKKSPLCLVASHYTC

**SEQ ID 71 D56A-AG10**

1 ATGCAACTTG GGCTTTATGC ATTGGAAATG GCTGTGGCCC ATCTTCTTCA TTGTTTTACT  
 61 TGGGAATTGC CAGATGGTAT GAAACCAAGT GAGCTTAAAA TGGATGATAT TTTTGGACTC  
 121 ACTGCTCCAA AAGCTAATCG ACTCGTGGCT GTGCCTACTC CACGTTTGTT GTGTCCCCTT  
 181 TATTAATTGA

**SEQ ID 72**

MQLGLYALEMAVAHLLHCFTWELPDGMKPSELKMDDIFGLTAPKANRLVAVPTPRLLCPLY

**FIG. 37****SEQ ID 73 58-BC5**

1 ATGCAACTT GGGCTTTATG CATTAGAAAT GGCAGTGGCC  
 61 CATCTTCTTC TTGCTTTAC TTGGGAATTG CCAGATGGTA TGAAACCAAG TGAGCTTAAA  
 121 ATGGATGATA TTTTGGACT CACTGCTCCA AGAGCTAATC GACTCGTGGC TGTGCCTAGT  
 181 CCACGTTTGT TGTGCCCACT TTATTAA

**SEQ ID 74**

MQLGLYALEMAVAHLLCFTWELPDGMKPSELKMDDIFGLTAPRANRLVAVPSRLLCPLY

**FIG. 38****SEQ ID 75 D58-AD12**

1 ATGCAACTT GGGCTTTATG CATTGGAAAT GGCTGTGGCC  
 61 CATCTTCTTC ATTGTTTTAC TTGGGAATTG CCAGATGGTA TGAAACCAAG TGAGCTTAAA  
 121 ATGGATGATA TTTTGGACT CACTGCTCCA AGAGCTAATC GACTCGTGGC TGTGCCTACT  
 181 CCACGTTTGT TGTGTCCCCT TTATTAA

**SEQ ID 76**

MQLGLYALEMAVAHLLHCFTWELPDGMKPSELKMDDIFGLTAPRANRLVAVPTPRLLCPLY

**FIG. 39****SEQ ID 77 D56-AC11**

1 ATGCTTTGG AGTGCGAGTA TAGTGCGCGT CAGCTACCTA  
 61 ACTTGATATT ATAGATTCCA AGTATATGCT GGGTCTGTGT TCAGAGTAGC ATGA

**SEQ ID 78**

MLWSASIVRVSYLTICIYRFQVYAGSVFRVA

**FIG. 40****SEQ ID 79 D35-39**

1 ATGCTTTGG AGTGCGAGTA TAGTGCGCGT CAGCTACCTA  
 61 ACTTGATATT ATAGATTCCA AGTATATGCT GGGTCTGTGT TCAGAGTAGC ATGA

**SEQ ID 80**

MLWSASIVRVSYLTICIYRFQVYAGSVFRVA

## SEQ ID 81

D58-BH4

1 ATGCTTTGG AGTGCGAGTA TAGTGCGCGT CAGCTACCTA  
61 ACCTGTATTT ATAGATTCCA AGTATATGCT GGGTCTGTGT TCAGAGTAGC ATGA

## SEQ ID 82

MLWSASIVRVSYLTCIYRFQVYAGSVFRVA

## FIG. 42

## SEQ ID 83

D177-BD7

1 ATTAATTTTT CAATACCACT TGTGAGCTT GCACTTGCTA ATCTATTGTT TCATTATAAT  
61 TGGTCACTTC CTGAGGGGAT GCTACCTAAG GATGTTGATA TGGAAGAAGC TTGGGGGATT  
121 ACCATGCACA AGAAATCTCC CCTTGCTTA GTAGCTTCTC ATTATAACTT GTTGTGA

## SEQ ID 84

INFSIPLVELALANLLFHYNWSLPEGMLPKDMDMEEALGITMHKKSPLCLVASHYNLL

## FIG. 43

## SEQ ID 85

D176-BF2

1 AT ATCATTTGGT TTGGCTAATG TTTATTTGCC ACTAGCTCAA  
121 TTGTTATATC ATTTTGATTG GAAACTCCCT ACTGGAATCA ATTCAAGTGA CTTGGACATG  
181 ACTGAGTCGT CAGGAGTAAC TTGTGCTAGA AAGAGTGATT TATACTTGAC TGCTACTCCA  
241 TATCAACTTT CTCAAGAGTG A

## SEQ ID 86

GISFGLANVYLPLAQLLYHFDWKLPTGINSSDLDMTESGVTCAKSDLYLTATPYQLSQE

## FIG. 44

## SEQ ID 87

D56-AD6

1 ATGCTTTGG AGTGCGAGTA TAGTGCGCGT CAGCTACCTA  
61 ACTTGTATTT ATAGATTCCA AGTATATGCT GGGTCTGTGT CCAGAGTAGC ATGA

## SEQ ID 88

MLWSASIVRVSYLTCIYRFQVYAGSVSRVA

## FIG. 45

## SEQ ID 89

D73A-AD6

1 CT GAATTTTGCA ATGTTAGAGG CAAAAATGGC ACTTGCATTG  
121 ATTCTACAAC ACTATGCTTT TGAGCTCTCT CCATCTTATG CACATGCTCC TCATACAATT  
181 ATCACTCTGC AACCTCAACA TGGTGCTCCT TTGATTTTGC GCAAGCTGTA G

## SEQ ID 90

LNFAMLEAKMALALILQHYAFELSPSYAHAPHTIITLQPQHGA PLILRKL

**SEQ ID 91 D70A-BA11**

1 CT GAATTTTGCA ATGTTAGAGG CAAAAATGGC ACTTGCAATG  
 121 ATTCTACAAC ACTATGCTTT TGAGCTCTCT CCATCTTATG CACACGCTCC TCATACAATT  
 181 ATCACTCTGC AACCTCAACA TGGTGCTCCT TTGATTTTGC GCAAGCTGTA G

**SEQ ID 92**

LNFMLEAKMALALILQHYAFELSPSYAHAPHTIITLQPQHGAPLILRKL

**FIG. 47****SEQ ID 93 D70A-BB5**

1 AA TAATTTTGCA ATGTTGGAAG CTAAGATTGC CTTAGCAATG  
 121 ATCCTACAGC GTTTTGCTTT CGAGCTTTCT CCATCTTACG CTCATGCACC TACTTATGTC  
 181 GTCACCTTTC GACCTCAGTG TGGTGCTCAC TTAATCTTGC AAAAATTATA GGTCTTAAT  
 241 CTGGATTTC CATTATTGAG TAGTGCCTAA TAAATCTTCT CTATCACTAT TTTCCATCT  
 301 TTCA

**SEQ ID 94**

NNFAMLETKIALAMILQRFELSPSYAHAPTYVVTLRPQCGAHLILQKL

**FIG. 48****SEQ ID 95 D70A-AB5**

1 AGCGAAGGGG TGGCAAAGGC AACAAAGGGG AAAATGACAT ATTTTCCATT TGGTGCAGGA  
 61 CCGCGAAAAT GCATTGGGCA AAACCTCGCG ATTTTGGAAG CAAAAATGGC TATAGCTATG  
 121 ATTCTACAAC GCTTCTCCTT CGAGCTCTCC CCATCTTATA CACACTCTCC ATACACTGTG  
 181 GTCACCTTGA AACCCAAATA TGGTGCTCCC CTAATAATGC ACAGGCTGTA GTCCTGTGAG  
 241 AATATGCTAT CCGAGGAATT CAGTTCCT

**SEQ ID 96**

QNFAILEAKMAIAMILQRFSEFELSPSYTHSPYTVVTLKPKYGAPLIMHRL

**FIG. 49****SEQ ID 97 D70A-AA8**

1 AGCGAAGGGG TGGCAAAGGC AACAAAGGGG AAAATGACAT ATTTTCCATT TGGTGCAGGA  
 61 CCGCGAAAAT GCATTGGGCA AAACCTCGCG ATTTTGGAAG CAAAAATGGC TATAGCTATG  
 121 ATTCTACAAC GCTTCTCCTT CGAGCTCTCT CCATCTTATA CACACTCTCC ATACACTGTG  
 181 GTCACCTTGA AACCCAAATA TGGTGCTCCC CTAATAATGC ACAGGCTGTA GTCCTGT

**SEQ ID 98**

QNFAILEAKMAIAMILQRFSEFELSPSYTHSPYTVVTLKPKYGAPLIMHRL

**FIG. 50****SEQ ID 99 D70A-AB8**

1 C AAAATTTTGC CATGTTAGAA GCAAAGATGG CTCTGTCTAT GATCCTGCAA  
 121 CGCTTCTCTT TTGAACTGTC TCCGTCTTAT GCACATGCCC CTCAGTCCAT ATTAACCGT  
 181 CAGCCACAAT ATGGTGCTCC ACTTATTTTC CACAAGCTAT AA

**SEQ ID 100**

QNFAMLEAKMALSMILQRFSEFELSPSYAHAPQSILTVQPQYGAPLIFHKL

**SEQ ID 101 D70A-BH2**

1 AT AAACCTTTGCA ATGACAGAAG CGAAGATGGC TATGGCTATG  
121 ATTCTGCAAC GCTTCTCCTT TGAGCTATCT CCATCTTACA CACATGCTCC ACAGTCTGTA  
181 ATAACCTATGC AACCCCAATA TGGTGCTCCT CTTATATTGC ACAAATTGTA A

**SEQ ID 102**

INFAMTEAKMAMAMILQRFSFELSPSYTHAPQSVITMQPQYGAPLILHKL

**FIG. 52****SEQ ID 103 D70A-AA4**

1 AT AAACCTTTGCA ATGGCAGAAG CGAAGATGGC TATGGCTATG  
121 ATTCTGCAAC GCTTCTCCTT TGAGCTATCT CCATCTTACA CACATGCTCC ACAGTCTGTA  
181 ATAACCTATGC AACCCCAATA TGGTGCTCCT CTTATATTGC ACAAATTGTA A

**SEQ ID 104**

INFAMAEAKMAMAMILQRFSFELSPSYTHAPQSVITMQPQYGAPLILHKL

**FIG. 53****SEQ ID 105 D70A-BA1**

1 CA AAACCTTTGCA ATGATGGAAG CAAAAATGGC AGTAGCTATG  
121 ATACTACAAA AATTTTCCTT TGAACCTATCC CCTTCTTATA CACATGCTCC ATTTGCAATT  
181 GTGACTATTC ATCCTCAGTA TGGTGCTCCT CTGCTTATGC GCAGACTTTA A

**SEQ ID 106**

QNFAMMEAKMAVAMILQKFSFELSPSYTHAPFAIVTIHPQYGAPLLMRRL

**FIG. 54****SEQ ID 107 D70A-BA9**

1 CA AAACCTTTGCA ATGATGGAAG CAAAAATGGC AGTAGCTATG  
121 ATACTACATA AATTTTCCTT TGAACCTATCC CCTTCTTATA CACATGCTCC ATTTGCAATT  
181 GTGACTATTC ATCCTCAGTA TGGTGCTCCT CTGCTTATGC GCAGACTTTA A

**SEQ ID 108**

QNFAMMEAKMAVAMILHKFSFELSPSYTHAPFAIVTIHPQYGAPLLMRRL

**FIG. 55****SEQ ID 109 D70A-BD4**

1 CA AAATTTTGCT ATGTTAGAGG CTAAATGGC AATGGCTATG  
121 ATTCTGAAAA CCTATGCATT TGAACCTCTCT CCATCTTATG CTCATGCTCC TCATCCACTA  
181 CTACTTCAAC CTCAATATGG TGCTCAATTA ATTTTGTACA AGTTGTAG

**SEQ ID 110**

QNFAMLEAKMAMAMILKTYAFELSPSYAHAPHPLLLQPQYGAQLILYKL

**SEQ ID 111 D181-AC5**

1 TATAGCATGG GGCTCAAGGC GATTCAAGCT AGCTTAGCTA  
 61 ATCTTCTACA TGGATTTAAC TGGTCATTGC CTGATAATAT GACTCCTGAG GACCTCAACA  
 121 TGGATGAGAT TTTTGGGCTC TCTACACCTA AAAAATTTCC ACTTGCTACT GTGATTGAGC  
 181 CAAGACTTTC ACCAAAACCTT TACTCTGTTT **GA**

**SEQ ID 112**

YSMGLKAIQASLANLLHGFNWSLPDNMTPELNMDEIFGLSTPKKFPLATVIEPRLSPKLYSV

**FIG. 57****SEQ ID 113 D144-AH1**

1 TAT AGCTTGGGGC TCAAGGAGAT TCAAGCTAGC  
 61 TTAGCTAATC TTCTACATGG ATTTAACTGG TCATTGCCTG ATAATATGAC TCCTGAGGAC  
 121 CTCAACATGG ATGAGATTTT TGGGCTCTCT ACACCTAAAA AATTTCCACT TGCTACTGTG  
 181 ATTGAGCCAA GACTTTCACC AAACTTTAC TCTGTTT**TGA**

**SEQ ID 114**

YSLGLKEIQASLANLLHGFNWSLPDNMTPELNMDEIFGLSTPKKFPLATVIEPRLSPKLYSV

**FIG. 58****SEQ ID 115 D34-65**

1 CATAGCTTG GGGCTCAAGG TGATTCAAGC TAGCTTAGCT  
 61 AATCTTCTAC ATGGATTAA CTGGTCATTG CCTGATAATA TGACTCCTGA GGACCTCAAC  
 121 ATGGATGAGA TTTTGGGCT CTCTACACCT AAAAAATTTT CACTTGCTAC TGTGATTGAG  
 181 CCAAGACTTT CACCAAACT TTACTCTGTT **TGA**

**SEQ ID 116**

HSLGLKVIQASLANLLHGFNWSLPDNMTPELNMDEIFGLSTPKKFPLATVIEPRLSPKLYSV

**FIG. 59****SEQ ID 117 D35-BG2**

1 CTGTGCTTT CCATGTTTAA TCTCTAGTTA TATACTGGCT  
 61 TTGAATGTGA ATCTGTATCA TAATTTCTTG CAAATTTCTC CTTCCATTTT **TTATTAA**

**SEQ ID 118**

LCFPCLISSYILALNVNLYHNFLQISPSISY

**FIG. 60****SEQ ID 119 D73A-AH7**

1 TCTG GACTTGCTCA ATGTGTGGTT GGTTTAGCTT TAGCAACTCT AGTGCAGTGT  
 121 TTTGAGTGGA AAAGGGTAAG CGAAGAGGTG GTTGATTGA CGGAAGGAAA AGGTCTCACT  
 181 ATGCCAAAAC CCGAGCCACT CATGGCTAGG TGCGAAGCTC GTGACATTTT TCACAAAGTT  
 241 CTTTCAGAAA TATCT**TAA**

**SEQ ID 120**

SGLAQCQVGLALATLVQCFEWRVSEEVVDLTEGKGLTMPKPEPLMARCEARDIFHKVLSEIS

**SEQ ID 121 D58-AA1**

1 TTGGGCTTG GCAACGGTGC ATGTGAATTT GATGTTGGCC  
 61 CGAATGATTC AAGAATTTGA ATGGTCCGCT TACCCGAAA ATAGGAAAGT GGATTTTACT  
 121 GAGAAATTGG AATTTACTGT GGTGATGAAA AATCCTTTAA GAGCTAAGGT CAAGCCAAGA  
 181 ATGCAAGTGG TGTAA

**SEQ ID 122**

LGLATVHVNLMLARMIQFEWSAYPENRKVDFTEKLEFTVVMKNPLRAKVKPRMQVV

**FIG. 62****SEQ ID 123 D73A-AE10**

1 TATGCTT TGGCTATGCT TCATTTAGAG  
 121 TACTTTGTGG CTAATTTGGT TTGGCATTIT CGATGGGAGG CTGTGGAGGG AGATGATGTT  
 181 GATCTTTCAG AAAAGCTAGA ATTCACCGTT GTGATGAAGA ATCCACTTCG AGCTCGTATC  
 241 TGCCCCAGAG TTAACCTCTAT TTGA

**SEQ ID 124**

YALAMLHLEYFVANLVWHFRWEAVEGDDVDLSEKLEFTVVMKNPLRARICPRVNSI

**FIG. 63****SEQ ID 125 D56A-AC12**

1 GGTCAGCAAG TTGGACTTCT TAGAACAACC ATTTTCATCG CCTCATTACT GTCTGAATAT  
 61 AAGCTGAAAC CTCGCTCACA CCAGAAACAA GTTGAACCTCA CCGATTTAAA TCCAGCAAGT  
 121 TGGCTTCATT CGATAAAAGG CGAACTGTTA GTCGATGCGA TTCCTCGAAA GAAGGCGGCA  
 181 TTTTAA

**SEQ ID 126**

GQQVGLLRTTIFIASLLSEYKLKPRSHQKQVELTDLNPASWLHSIKGELLVDAIPRKKAFF

**FIG. 64****SEQ ID 127 D177-BF7**

1 ATCACATTTG CTAAGTTTGT GAATGAGCTA  
 121 GCATTGGCAA GATTAATGTT CCATTTTGAT TTCTCGCTAC CAAAAGGAGT TAAGCATGAG  
 181 GATTTGGACG TGGAGGAAGC TGCTGGAATT ACTGTTAGAA GGAAGTCCC CCTTTTAGCC  
 241 GTCGCCACTC CATGCTCGTG A

**SEQ ID 128**

ITFAKFVNELALARLMFHFDLSLPKGVKHEDLDVEEAAGITVRRKFPLAVATPCS

**FIG. 65****SEQ ID 129 D73A-AG3**

1 CA GAGGTATGCT ATAAACCATT TGATGCTCTT TATTGCGTTG  
 121 TTCACGGCTC TGATTGATTT CAAGAGGCAC AAAACGGACG GCTGTGATGA TATCGCGTAT  
 181 ATTCCAACCA TTGCTCCAAA GGATGATTGT AAAGTGTTCC TTTCACAGAG GTGCACTCGA  
 241 TTCCCATCTT TTTCATGA

**SEQ ID 130**

QRYAINHLMLFIALFTALIDFKRHKTGDCDDIAYIPTIAPKDDCKVFLSQRCTRFPSFS

**SEQ ID 131 D70A-AA12**

1 ATG TCATTTGGTT TAGCTAATCT TTA~~CT~~TACCA TTGGCTCAAT  
 121 TACTCTATCA CTTT~~GA~~CTGG AA~~CT~~CCCCAA CCGGAATCAA GCCAAGAGAC TTGGACTTGA  
 181 CCGAATTATC GGGAATAACT ATTGCTAGAA AGGGTGACCT TTA~~CT~~TAAAT GCTACTCCTT  
 241 ATCAACCTTC TCGAGAGTAA

**SEQ ID 132**

MSFGLANLYLPLAQLLYHFDWKLPTGIKPRDLDT~~EL~~SGITIARKGDLYLNATPYQPSRE

**FIG. 67****SEQ ID 133 D185-BC1**

1 TTGGGCTTG GCAACGGTGC ATGTGAATTT GATGTTGGCC  
 61 CGAACGATTC AAGAATTTGA ATGGTCCGCT TACCCGGAAA ATAGGAAAGT GGATTT~~CT~~ACT  
 121 GAGAAATTGG AATTTACTGT GGTGATGAAA AACCCTTTAA GAGCTAAGGT CAAGCCAAGA  
 181 ATGCAAGTGG TGTA~~A~~

**SEQ ID 134**

LGLATVHVNLMLARTIQEFWSAYPENRKVD~~FT~~EKLEFTVVMKNPLRAKVKPRMQVV

**FIG. 68****SEQ ID 135 D185-BG2**

1 TTGGGCTTG GCAACGGTGC ATGTGAATTT GATGTTGGCC  
 61 CGAATGATTC AAGAATTTGA ATGGTCCGCT TACCCGGAAA ATAGGAAAGT GGATTTACTG  
 121 AGAAATTGGA ATTTACTGTG GTGA

**SEQ ID 136**

LGLATVHVNLMLARMIQEFWSAYPENRKVDLLRNWNLW

**FIG. 69****SEQ ID 137 D185-BE1**

1 ATCACATTT GCTAAGTTTG TGAATGAGCT AGCATTGGCA  
 61 AGATTAATGT TCCATTTTGA TTTCTCGCTA CCAAAAGGAG TTAAGCATGA GGATTTGGAC  
 121 GTGGAGGAAG CTGCTGGAAT TACTGTTAGG AGGAAGTTCC CCCTTTTAGC CGTCGCCACT  
 181 CCATGCTCGT GA

**SEQ ID 138**

ITFAKFVNELALARLMFHDFSLPKGVKH~~ED~~LDVEEAAGITVRRKFPLLAVATPCS

**FIG. 70****SEQ ID 139 D185-BD2**

1 ATCACATTT GCTAAGTTTG TGAATGAGCT AGCATTGGCA  
 61 AGATTAATGT TCCATTTTGA TTTCTCGCTA CCAAAAGGAG TTAAGCATGC GGATTTGGAC  
 121 GTGGAGGAAG CTGCTGGAAT TACTGTTAGA AGGAAGTTCC CCCTTTTAGC CGTCGCCACT  
 181 CCATGCTCGT GA

**SEQ ID 140**

ITFAKFVNELALARLMFHDFSLPKGVKHADLDVEEAAGITVRRKFPLLAVATPCS

**SEQ ID 141 D176-BG2**

1 CA AAATTTTGCC ATGTTAGAAG CAAAGACTAC TTTGGCTATG  
121 ATCCTACAAC GCTTCTCCTT TGAAGTGTCT CCATCTTATG CACATGCTCC TCAGTCCATA  
181 ATAACCTTGC AACCCAGTA TGGTGCTCCA CTTATTTTGC ATAAAATATA **G**

**SEQ ID 142**

QNFAMLEAKTTLAMILQRFSFELSPSYAHAPQSIITLQPQYGAPLILHKI

**FIG. 72****SEQ ID 143 D185-BD3**

1 ATTATCCTT GCACTGCCAA TTCTTGGCAT TACCTTGGGA  
61 CGCTTGGTGC AGAACTTTGA GTTGTGCTCT CCTCCAGGAC AGTCAAAGCT TGACACAACA  
121 GAGAAAGGCG GGCAATTCAG TCTGCACATT TTGAAGCATT CCACCATTGT GATGAAACCA  
181 AGATCTTTTT **AA**

**SEQ ID 144**

IILALPILGITLGRVLVQNFELLPPPGQSKLDTTEKGGQFSLHILKHSTIVMKPRSF

**FIG. 73****SEQ ID 145 D176-BC3**

1 C AAAATTTTGC CATGTTAGAA GCAAAGACTA CTTTGGCTAT  
121 GATCCTACAA CGCTTCTCCT TTGAAGTGT TCCATCTTAT GCACATGCTC CTCAGTCCAT  
181 AATAACTTGC AACCCAGTA TGGTGCTCCA CTTATTTTGC ATAAAATATA GTTTATTACT  
241 TGTAAGTAGT GTCTCGTTTT ATGTTAAGCA TGAGTCCAAA ATGTTAAGGC TTGTAGAAGT  
301 GCAAATGGG AATGCATTTG CACTCGTGCA CTGTAGATTG **TTGTAA**

**SEQ ID 146**

QNFAMLEAKTTLAMILQRFSFELSPSYAHAPQSIITCNPSMVLHLFCIKYSLLLVSSVSFYVKHESKMLRLVELQNGNA  
FALVHCRL

**FIG. 74****SEQ ID 147 D176-BB3**

1 GCTGAT  
61 ATGGGGTTGC GAGCAGTTTC TTTGGCATTG GGTGCACTTA TTCAATGCTT TGAAGTGGCAA  
121 ATTGAGGAAG CGGAAAGCTT GGAGGAAAGC TATAATTCTA GAATGACTAT GCAGAACAAAG  
181 CCTTTGAAGG TTGTCTGCAC TCCACGCGAA GATCTTGGCC AGCTTCTATC CCAACTCT**AA**

**SEQ ID 148**

ADMGLRAVSLALGALIQCFDWQIEEAESLEESYNSRMTMQNKPLKVCTPREDLGQLLSQL

NAME D89-AB1  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 149

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1 CTTCCTTCCT AAGTCCTAAC TAAAAATGGA GATTCAGTTT TCTAACTTAG TTGCATTCTT
61 GCTCTTTCTC TCCAGCATCT TTCTTCTATT CAAAAAATGG AAAACCAGAA AACTAAATTT
121 GCCTCCTGGT CCATGGAAAT TACCTTTTAT TGGAAGTTTA CACCATTTGG CTGTGGCAGG
181 TCCACTTCCT CACCATGGCC TAAAAAATTT AGCCAAACGC TATGGTCCTC TTATGCATTT
241 ACAACTTGGA CAAATTCCTA CACTCATCAT ATCATCACCT CAAATGGCAA AAGAAGTACT
301 AAAAATCTAC GACCTCGCTT TTGCCACTAG ACCAAAGCTT GTCGCGGCCG ACATCATTCA
361 CTACGACAGC ACGGACATAG CATTTTCTCC GTACGGTGAA TACTGGAGAC AAATTCGTAA
421 AATTTGCATA TTGGAACCTC TGAGTGCCAA GATGGTCAAA TTTTTTAGCT CGATTGCGCA
481 AGATGAGCTC TCGAAGATGC TCTCATCTAT ACGAACGACA CCCAATCTTA CAGTCAATCT
541 TACTGACAAA ATTTTTTGGT TTACGAGTTC GGTAACCTGT AGATCAGCTT TAGGGAAGAT
601 ATGTGGTGAC CAAGACAAAT TGATCATTTT TATGAGGGAA ATAATATCAT TGGCAGGTGG
661 ATTTAGTATT GCTGATTTTT TCCCTACATG GAAAATGATT CATGATATTG ATGGTTCGAA
721 ATCTAAACTG GTGAAAGCAC ATCGTAAGAT TGATGAAATT TTGGGAAATG TTGTTGATGA
781 GCACAAAAAG AACAGAGCAG ATGGCAAGAA GGGTAATGGT GAATTTGGTG GTGAAGATTT
841 GATTGATGTA TTGTTAAGAG TTAGAGAAAG TGGAGAAAGT CAAATTCCTA TCACAAATGA
901 CAATATCAAA TCAATATTAA TCGACATGTT CTCTGCAGGA TCTGAAACAT CATCGACGAC
961 TATAATTTGG GCATTAGCTG AAATGATGAA GAAACCAAGT GTTTTAGCAA AGGCACAAGC
1021 TGAAGTAAGG CAAGCTTTGA AGGAGAAAAA AGGTTTTCAA CAGATTGATC TTGATGAGCT
1081 AAAATATCTC AAGTTAGTAA TCAAAGAAAC CTTAAGAATG CACCCTCCAA TTCCTCTATT
1141 AGTTCCTAGA GAATGTATGG AGGATACAAA GATTGATGGT TACAATATAC CTTTCAAAAC
1201 AAGAGTCATA GTTAATGCAT GGGCAATCGG ACGAGATCCA GAAAGTTGGG ATGACCCCGA
1261 AAGCTTTATG CCAGAGAGAT TTGAGAATAG TTCTATTGAC TTTCTTGGA ATCATCATCA
1321 GTTTATACCA TTTGGTGACG GAAGAAGGAT TTGTCCGGGA ATGCTATTTG GTTTAGCTAA
1381 TGTTGGACAA CCTTTAGCTC AGTTACTTTA TCACTTCGAT TGGAAGTCC CTAATGGACA
1441 AAGTCATGAG AATTTGACA TGACTGAGTC ACCTGGAATT TCTGCTACAA GAAAGGATGA
1501 TCTTGTTTTG ATTGCCACTC CTTATGATTC TTATTAAGCA GTAGCAGAAA TAAAAAGCCG
1561 GGGCAAACAG AAAAAA

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SEQ. ID. NO. 150

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1 MEIQFSNLVA FLLFLSSIFL LFKKWKTRKL NLPPGPWKLP FIGSLHHLAV AGPLPHHGLK
61 NLAKRYGPLM HLQLGQIPTL IISSPQMAKE VLKTHDLAFA TRPKLVAADI IHYDSTDIAF
121 SPYGEYWRQI RKICILELLS AKMVKFFSSI RQDELSKMLS SIRTTPNLTV NLTDKIFWFT
181 SSVTCRSALG KICGDQDKLI IFMREIISLA GGFSIADFFP TWKMIHDIDG SKSKLVKAHR
241 KIDEILGNVV DEHKKNRADG KKGNGEFGGE DLIDVLLRVR ESGEVQIPIT NDNIKSILID
301 MFSAGSETSS TTIIWALAEM MKKPSVLAKA QAEVRQALKE KKGQQIDLD ELKYLKLVK
361 ETLRMHPPPIP LLVPRECMED TKIDGYNIPF KTRVIVNAWA IGRDPESWDD PESFMPEFE
421 NSSIDFLGNH HQFIPFGAGR RICPGMLFGL ANVGQPLAQL LYHFDWKLPN GQSHENFDMT
481 ESPGISATRK DDLVLIATPY DSY

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NAME D89-AD2  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 151

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1 TCCTTCTTCC TTCCTAAGTC CTAACATAAAA ATGGAGATTC AGTTTTCTAA CTTAGTTGCA
61 TTCTTGCTCT TTCTCTCCAG CATCTTTCTT CTATTCAAAA AATGGAAAAAC CAGAAAACTA
121 AATTTGCCTC CTGGTCCATG GAAATTACCT TTTATTGGAA GTTTACACCA TTTGGCTGTG
181 GCAGGTCCAC TTCCTCACCA TGGCCTAAAA AATTTAGCCA AACGCTATGG TCCTCTTATG
241 CATTTACAAC TTGGACAAAT TCCTACACTC ATCATATCAT CACCTCAAAT GGCAAAAAGAA
301 GTACTAAAAA CTCACGACCT CGCTTTTGCC ACTAGACCAA AGCTTGTCGT GGCCGACATC
361 ATTCACTACG ACAGCACGGA CATAGCATTT TCTCCGTACG GTGAATACTG GAGACAAATT
421 CGTAAAATTT GCATATTGGA ACTCTTGAGT GCCAAGATGG TCAAATTTTT TAGCTCGATT
481 CGCCAAGATG AGCTCTCGAA GATGCTCTCA TCTATACGAA CGACACCCAA TCTTACAGTC
541 AATCTTACTG ACAAATTTT TTGGTTTACG AGTTCGGTAA CTTGTAGATC AGCTTTAGGG
601 AAGATATGTG GTGACCAAGA CAAATTGATC ATTTTATGA GGGAAATAAT ATCATTGGCA
661 GGTGGATTTA GTATTGCTGA TTTTTCCTT ACATGGAAAA TGATTCATGA TATTGATGGT
721 TCGAAATCTA AACTGGTGAA AGCACATCGT AAGATTGATG AAATTTTGGG AAATGTTGTT
781 GATGAGCACA AAAAGAACAG AGCAGATGGC AAGAAGGGTA ATGGTGAATT TGGTGGTGAA
841 GATTTGATTG ATGTATTGTT AAGAGTTAGA GAAAGTGGAG AAGTTCAAAT TCCTATCACA
901 AATGACAATA TCAAATCAAT ATTAATCGAC ATGTTCTCTG CGGGATCTGA AACATCATCG
961 ACGACTATAA TTTGGGCATT AGCTGAAATG ATGAAGAAAC CAAGTGTTTT AGCAAAAGCA
1021 CAAGCTGAAG TAAGGCAAGC TTTGAAGGAG AAAAAAGGTT TTCAACAGAT TGATCTTGAT
1081 GAGCTAAAAT ATCTCAAGTT AGTAATCAAA GAAACCTTAA GAATGCACCC TCCAATTCCT
1141 CTATTAGTTC CTAGAGAATG TATGGAGGAT ACAAAGATTG ATGGTTACAA TATACCTTTC
1201 AAAACAAGAG TCATAGTTAA TGCATGGGCA ATCGGACGAG ATCCAGAAAG TTGGGATGAC
1261 CCCGAAAGCT TTATGCCAGA GAGATTTGAG AATAGTTCTA TTGACTTTCT TGGAAATCAT
1321 CATCAGTTTA TACCATTTGG TGCAGGAAGA AGGATTTGTC CGGGAATGCT ATTTGGTTTA
1381 GCTAATGTTG GACAACCTTT AGCTCAGTTA CTTTATCACT TCGATTGGAA ACTCCCTAAT
1441 GGACAAAGTC ATGAGAATTT CGACATGACT GAGTCACCTG GAATTTCTGC TACAAGAAAG
1501 GATGATCTTG TTTTGATTGC CACTCCTTAT GATTCTTATT AAGCAGTAGC AGAAATAAAA
1561 AGCCGGGGCA AACAGAAAAA A

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SEQ. ID. NO. 152

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1 MEIQFSNLVA FLLFLSSIFL LFKKWKTRKL NLPPGPWKLP FIGSLHHLAV AGPLPHHGLK
61 NLAKRYGPLM HLQLGQIPTL IISSPQMAKE VLKTHDLAFA TRPKLVVADI IHYDSTDIAF
121 SPYGEYWRQI RKICILELLS AKMVKFFSSI RQDELSKMLS SIRTTPNLTV NLTDKIFWFT
181 SSVTCRSALG KICGDQDKLI IFMREIISLA GGFSIADFFP TWKMIHDIDG SKSKLVKAHR
241 KIDEILGNVV DEHKKNRADG KKGNGEFGGE DLIDVLLRVR ESGEVQIPIT NDNIKSILID
301 MFSAGSETSS TTIIWALAEM MKKPSVLAKA QAEVRQALKE KKGQQIDLD ELKYLKLVK
361 ETLRMHPPPIP LLVPRECMED TKIDGYNIPF KTRVIVNAWA IGRDPESWDD PESFMPERFE
421 NSSIDFLGNH HQFIPFGAGR RICPGMLFGL ANVGQPLAQL LYHFDWKLPN GQSHENFDMT
481 ESPGISATRK DDLVLIATPY DSY

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NAME D90A-BB3  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 153

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1 CAACTGCAGT TTGAAGATAC CAACTAACCA AAATGCAGTT CTTCAGCTTG GTTTCATT
61 TCCTATTTCT ATCTTTTCTC TTTTGTGTTA GGAAATGGAA GAACTCGAAT AGCCAAAGGA
121 AAAAATTGCC ACCAGGTCCA TGGAACTAC CAATACTAGG AAGTATGCTT CATATGGTTG
181 GTGGACTACC ACACCATGTC CTTAGAGATT TAGCCAAAAA ATATGGACCG CTTATGCACC
241 TTCAATTAGG TGAAGTTTCT GCAGTTGTGG TTA CTCTCC TGATATGGCA AAAGAAGTAC
301 TAAAAACTCA TGACATCGCT TTCGCGTCTA GGCCTAGCCT TTTGGCCCCG GAGATTGTCT
361 GTTACAATAG GTCTGATCTT GCGTTTGGCC CCTATGGCGA TTATTGGAGA CAAATGCGTA
421 AAATATGTGT CTTGGAAGTG CTCAGTGCCA AGAATGTTCG GACATATAGC TCTATTAGGC
481 GCGATGAAGT TCTTCGTCTC CTTAATTTTA TCCGGTCATC TTCTGGTGAG CCTGTAAATA
541 TTACGGAAAG GATCTTTTTG TTCACAAGCT CCATGACATG TAGATCAGCG TTTGGGCAAG
601 TATTCAAGGA GCAAGACAAA TTTATACAAC TAATTAAAGA AGTTATACTC TTAGCAGGAG
661 GGTTTGATGT GGCTGACATA TTCCCTTCAT ACAAGTCTCT TCATGAGTCT AGTGAATGA
721 AGGGTAAGAT TATGAATGCA CACCATAAGG TAGATGCTAT TGTTGAGAAT GTCATCAACG
781 AGCACAAGAA AAATCTTGCA ATTGGGAAAA CTAATGGAGC GTTAGGAGGT GAAGATTTAA
841 TTGATGTTCT TCTAAAACCT ATGAATGATG GAGGCCTTCA ATTTCCATAT ACCAACGACA
901 ACATCAAAGC TATAATCTTT GACATGTTTG CTGCTGGAAC AGAGACTTCA TCGTCAACAA
961 TTGTGTGGGC TATGGTGGAAT ATGGTGAAAA ATCCAACGTG ATTTGCGAAA GCTCAAGCAG
1021 AAGTAAGAGA TGCATTTAGA GAAAAAGAAA CTTTGTGATGA AAATGATGTG GAGGAGCTAA
1081 ACTATCTAAA GTTAGTCATT AAAGAACTC TAAGACTTCA TCCACCGGTT CCACTTTTGC
1141 TCCCAAGAGA ATGTAGGGAA GAGACAAATA TAAACGGCTA CACTATTCCT GTAAAGACCA
1201 AAGTCATGGT TAATGTTTGG GCATTGGGAA GAGATCCAAA ATATTGGGAT GATGCAGAAA
1261 CTTTTAAGCC AGAGAGATTT GAGCAGTGCT CTAAGGATTT TGTTGGTAAT AATTTTGAAT
1321 ATCTTCCATT TGGTGCTGGA AGGAGGATTT GTCCAGGGAT TTCGTTTGGT TTAGCTAATG
1381 CTTATTTGCC ATTGGCTCAA TTACTTTATC ACTTTGATTG GGAACCTCCC ACTGGAATCA
1441 AACCAAGCGA CTTGGACTTG ACTGAGTTGG TTGGAGTAAC TGCCGCTAGA AAAAGTGACC
1501 TTTACTTGGT TGCGACTCCT TATCAACCTC CTCAAAAAC

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SEQ. ID. NO. 154

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1 MQFFSLVSIF LFLSFLFLLR KWKNSNSQRK KLPPGPWKLP ILGSMMLHMVG GLPHHVLRDL
61 AKKYGPLMHL QLGEVSAVVV TSPDMAKEVL KTHDIAFASR PSLLAPEIVC YNRSDLAFCP
121 YGDYWRQMRK ICVLEVLAK NVRTYSSIRR DEVLRLNFI RSSSGEPVNI TERIFLFTSS
181 MTCRSAFGQV FKEQDKFIQL IKEVILLAGG FDVADIFPSY KSLHVLSGMK GKIMNAHHKV
241 DAIVENVINE HKKNLAIGKT NGALGGEDLI DVLLKLMNDG GLQFPITNDN IKAIIFDMFA
301 AGTETSSSTI VWAMVEMVKN PTVFAKAQAE VRDAFREKET FDENDVEELN YLKLVIKETL
361 RLHPPVPLLL PRECREETNI NGYTIPVTK VMVNVWALGR DPKYWDDAET FKPERFEQCS
421 KDFVGNNFEY LPFGGRRIC PGISFGLANA YLPLAQLLYH FDWELPTGIK PSDLDLTEL
481 GVTAARKSDL YLVATPYQPP QN

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NAME D95-AG1  
ORGANISM NICOTIANA TABACUM  
SEQ. ID. NO. 155

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1 AAAAGATGTC TTCATTTTCC ACATCTTCTG CCACTTCTAA TTCCAAACTT CCAGTTCGAG
61 AAATCCCAGG AGACTATGGT TTCCCCTTTT TTGGAGCCAT AAAAGATAGA TATGACTACT
121 TCTACAACCT CGGCACAGAC GAATTCCTTC TTACCAAAT GCAAAAATAC AACTCTACTG
181 TCTTTAGAAC CAACATGCCA CCAGGTCCAT TCATTGCTAA AAATCCCAAA GTAATTGTTC
241 TCCTCGATGC CAAAACATTT CCCGTTCTTT TCGACAACCT TAAAGTCGAA AAAATGAACG
301 TTCTTGATGG CACGTACGTG CCATCTACTG ATTTCTATGG CGGATATCGC CCGTGTGCTT
361 ATCTTGATCC TTCTGAGTCA ACTCATGCCA CACTTAAAGG GTTCTTTTTA TCTTTAATCT
421 CCCAGCTTCA TAATCAATTT ATTCCTTTAT TTAGAACCTC AATTTCTGGT CTTTTCGCAA
481 ATCTTGAGAA TGAGATTTCC CAAAATGGCA AAGCGAACTT CAACAATATC AGCGACATTA
541 TGTCATTCTGA TTTTGTTTTT CGTTTGTTAT GTGACAAGAC CAGTCCCCAT GACACAAATC
601 TTGGCTCTAA TGGACCAAAA CTCTTTGATA TATGGCTGTT GCCTCAACTT GCTCCATTGT
661 TTAGTCTAGG TCTAAAATTT GTGCCGAAC TTTCTGGAAGA TTTAATGTTG CACTTTTTC
721 CCTTGCCATT TTTTCTAGTG AGATCGAATT ACCAGAAGCT TTATGATGCT TTTAGCAAGC
781 ATGCCGAAAG TACACTGAAT GAAGCAGAGA AGAATGGGAT CAAAAGAGAC GAAGCATGCC
841 ACAACTTAGT TTTTCTTGCA GGTTCATG CTTATGGTGG GATGAAAGTT TTATTCCTTG
901 CACTGATAAA GTGGGTCGCC AATGGAGGAA AGAGTTTACA CACTCGGCTG GCAAATGAAA
961 TCAGGACAAT TATCAAAGAA GAATGTGGGA CCATAACTCT ATCAGCAATC AACAAGATGA
1021 GTTTAGTAAA ATCAGTAGTG TATGAAGTAT TAAGAATTGA ACCTCCAGTT CCATTCCAAT
1081 ATGGTAAAGC CAAAGAAGAT ATCATAATCC AAAGCCATGA TTCAACTTTC TTAGTCAAGA
1141 AAGGTGAAAT GATCTTTGGA TATCAGCCTT TTGCTACAAA AGATCCAAAG ATTTTGTGACA
1201 AACCAGAGGA GTTTATTCCG GAGAGGTTCA TGGCCGAAGG GGAAAAATTA TTAAAGTATG
1261 TGTATTGGTC AAATGCAAGA GAGACAGATG ATCCAACGGT GGACAACAAA CAATGCCCAG
1321 CGAAAAATCT TGTCGTGCTT TTGTGCAGGT TGATGTTGGT GGAGGTTTTT ATGCGTTACG
1381 ACACATTAC AGTGGAGTCA ACAAAGCTCT TTCTTGGGTC ATCAGTAACG TTCACGACTC
1441 TGGAAAAGC GACATGAGTT TCAGATATCT TAATTGTAGG CTGCAAATAA TAATGTGGTC
1501 ATTCTGCAA TTATTGTACT TGTGCTGATG

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SEQ. ID. NO. 156

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1 MSSFSTSSAT SNSKLPVREI PGDYGFPPFG AIKDRYDYFY NLGTDEFFLT KMQKYNSTVF
61 RTNMPPGPFI AKNPKVIVLL DAKTFPVLF D NSKVEKMNVL DGTYPVSTDF YGGYRCPAYL
121 DPSESTHATL KGFFLSLISQ LHNQFIPLFR TSISGLFANL ENEISQNGKA NFMNISDIMS
181 FDFVFRLLCD KTSPhDTNLG SNGPKLFDIW LLPQLAPLFS LGLKFVPNFL EDLMLHTFPL
241 PFFLVRSNYQ KLYDAFSKHA ESTLNEAEKN GIKRDEACHN LVFLAGFNAY GGMKVLFPAL
301 IKWVANGGKS LHTRLANEIR TIIKEECGTI TLSAINKMSL VKSVVYEVLR IEPPVPFQYG
361 KAKEDII IQS HDSTFLVKKG EMIFGYQPFA TKDPKIFDKP EEFIPEPFMA EGKLLKYVY
421 WSNARETDDP TVDNKQCPAK NLVVLLCLRM LVEVFMRYDT FTVESTKLFL GSSVTFTTLE
481 KAT

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NAME D96-AB6  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 157

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1 CCAAAAATGG AGCTTCAATC TTCTCCTTTC AATTTAATTT CTTTGTTCTT CTTCTTTTCT
61 TTTCATTTTA TTCTAGTGAA GAAATGGAAT GCCAAAATCC CAAAGTTACC TCCAGGTCCG
121 TGGAGGCTTC CCTTTATTGG AAGCCTCCAT CACTTGAAGG GAAAACCTCC ACACCATAAT
181 CTTAGAGATC TAGCGCGAAA ATATGGGCCT CTCATGTACT TACAACTCGG AGAAATTCCT
241 GTAGTTGTAA TATCTTCGCC ACGTGTAGCA AAAGCTGTAC TAAAAACTCA TGATCTCGCT
301 TTTGCAACTA GACCACGATT CATGTCCTCA GACATTGTGT TTTACAAAAG CAGGGACATC
361 TCTTTTGCCC CATTTGGTGA TTACTGGAGA CAGATGCGTA AAATATTGAC TCAGGAACTC
421 CTGAGTAACA AGATGCTCAA GTCATATAGC TTAATCCGAA AGGATGAGCT CTCGAAGCTC
481 CTCTCATCGA TTCGTTTGGA AACAGGTTCT GCAGTGAACA TAAATGAAAA GCTTCTCTGG
541 TTTACGAGCT GCATGACCTG TAGATTAGCC TTTGGAAAAA TATGCAATGA TCGGGATGAG
601 TTGATCATGC TAATTAGGGA GATATTAACA TTATCAGGAG GATTTGATGT GGGTGATTGT
661 TTCCCTTCCT GGAAATTACT TCATAATATG AGCAACATGA AAGCTAGGTT GACGAATGTA
721 CACCACAAGT ATGATTTAGT TATGGAGAAC ATCATCAATG AGCACCAAGA GAATCATGCA
781 GCAGGGATAA AGGGTAACAA CGAGTTTGGT GGCGAAGATA TGATCGATGC TCTACTGAGG
841 GCTAAGGAGA ATAATGAGCT TCAATTTCTT ATCGAAAATG ACAACATGAA AGCAGTAATT
901 CTGGACTTGT TTATTGCTGG AACTGAAACT TCATATACTG CAATTATATG GGCACATATCA
961 GAATTGATGA AGCACCCAAG TGTGATGGCC AAGGCACAAG CTGAAGTGAG AAAAGTCTTC
1021 AAAGAAAATG AAAATTTTGA CGAAAATGAT CTTGACAAGT TGCCATACTT AAAATCAGTG
1081 ATTAAAGAAA CACTAAGGAT GCACCCTCCA GTTCCTTTGT TAGGGCCTAG AGAATGCAGG
1141 GACCAAACAG AGATCGATGG CTACACTGTA CCTATTAAAG CTAGAGTTAT GGTTAATGCT
1201 TGGGCGATAG GAAGAGATCC TGAAAGTTGG GAAGATCCTG AAAGTTTCAA ACCGGAGCGA
1261 TTTGAAAATA CTTCTGTTGA TCTTACAGGA AATCACTATC AGTTCATTCC TTTCGGTTCA
1321 GGAAGAAGAA TGTGTCCAGG AATGTCGTTT GGTTTAGTTA ACACAGGGCA TCCTTTAGCC
1381 CAGTTGCTCT ATTGCTTTGA CTGGAAACTC CCTGACAAGG TTAATGCAAA TGATTTTCGC
1441 ACTACTGAAA CAAGTAGAGT TTTTGCAGCA AGCAAAGATG ACCTCTACTT GATTCCCACA
1501 AATCACAGGG AGCAAGAATA GCTTAATTTA ATGGAGTTCT TGGAAGAATT AAAGAAGAAG
1561 GGCTATATAG GTGAGATTTT TTGTATGGTT GCA

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SEQ. ID. NO. 158

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1 MELQSSPFNL ISLFLFFSFH FILVKKWNK IPKLPPGPWR LPFIGSLHHL KGKLPHHNLR
61 DLARKYGPLM YLQLGEIPVV VISSPRVAKA VLKTHDLAFA TRPRFMSSDI VFYKSRDISF
121 APFGDYWRQM RKILTQELLS NKMLKSYSLL RKDELSKLLS SIRLETGSAV NINEKLLWFT
181 SCMTCRLAFG KICNDRDELI MLIREILTLS GGFDVGDLPF SWKLLHNMSN MKARLTNVHH
241 KYDLVMENII NEHQENHAAG IKGNNEFGGE DMIDALLRAK ENNELQFPIE NDNMKAVILD
301 LFIAGTETSY TAIIWALSEL MKHPSVMAKA QAEVRKVFKE NENFDENDLD KLPYLKSVIK
361 ETLRMHPPVP LLGPRECRDQ TEIDGYTVPI KARVMVNAWA IGRDPESWED PESFKPERFE
421 NTSVDLTGNH YQFIPFGSGR RMCPGMSFGL VNTGHPLAQL LYCFDWWKLPD KVNANDFRTT
481 ETSRVFAASK DDLYLIPTNH REQE

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NAME D96-AC2  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 159

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1 CTTCTTCCAA AAATGGAGCT TCAATCTTCT CCTTTCAATT TAATTTCTTT GTTCCTCTTC
61 TTTTCTTTTC TTTTATTCT AGTGAAGAAA TGGGAATGCCA AAATCCCAAA GTTACCTCCA
121 GGTCCGTGGA GGCTTCCCTT TATTGGAAGC CTCCATCACT TGAAGGGAAA ACTTCCACAC
181 CATAATCTTA GAGATCTAGC GCGAAAATAT GGACCTCTCA TGTACTTACA ACTCGGAGAA
241 ATTCTGTAG TTGTAATATC TTCGCCACGT GTAGCAAAAG CTGTACTAAA AACTCATGAT
301 CTCGCTTTTG CAACTAGACC ACGATTCATG TCCTCAGACA TTGTGTTTTA CAAAAGCAGG
361 GACATCTCTT TTGCCCCATT TGGTGATTAC TGGAGACAGA TCGCTAAAT ATTGACTCAG
421 GAACTCCTGA GTAACAAGAT GCTCAAGTCA TATAGCTTAA TCCGAAAGGA TGAGCTCTCG
481 AAGCTCCTCT CATCGATTCG TTTGGAAACA GGTTCCTGCAG TGAACATAAA TGAAAAGCTT
541 CTCTGGTTTA CGAGCTGCAT GACCTGTAGA TTAGCCTTTG GAAAAATATG CAATGATCGG
601 GATGAGTTGA TCATGCTAAT TAGGGAGATA TTAACATTAT CAGGAGGATT TGATGTGGGT
661 GATTTGTTCC CTTCTTGAA ATTACTTCAT AATATGAGCA ACATGAAAGC TAGGTTGACG
721 AATGTACACC ACAAGTATGA TTTAGTTATG GAGAACATCA TCAATGAGCA CCAAGAGAAT
781 CATGCAGCAG GGATAAAGGG TAACAACGAG TTTGGTGGCG AAGATATGAT CGATGCTCTA
841 CTGAGGGCTA AGGAGAAATA TGAGCTTCAA TTTCTTATCG AAAATGACAA CATGAAAGCA
901 GTAATTCTGG ACTTGTTTAT TGCTGGAAC TAACTTCAT ATACTGCAAT TATATGGGCA
961 CTATCAGAAT TGATGAAGCA CCAAGTGTG ATGGCCAAGG CACAAGCTGA AGTGAGAAAA
1021 GTCTTCAAAG AAAATGAAAA TTTCGACGAA AATGATCTTG ACAAGTTGCC ATACTTAAAA
1081 TCAGTGATTA AAGAAACACT AAGGATGCAC CCTCCAGTTC CTTTGTTAGG GCCTAGAGAA
1141 TGCAGGGACC AAACAGAGAT CGATGGCTAC ACTGTACCTA TTAAAGCTAG AGTTATGGTT
1201 AATGCTTGGG CGATAGGAAG AGATCCTGAA AGTTGGGAAG ATCCTGAAAG TTTCAAACCG
1261 GAGCGATTTG AAAATACTTC TGTGTATCTT ACAGGAAATC ACTATCAGTT CATTCCTTTC
1321 GGTTCAGGAA GAAGAATGTG TCCAGGAATG TCGTTTGGTT TAGTTAACAC AGGGCATCCT
1381 TTAGCCCAGT TGCTCTATTG CTTTGACTGG AAACCTCCCTG ACAAGGTTAA TGCAAATGAT
1441 TTTGCGACTA CTGAAACAAG TAGAGTTTTT GCAGCAAGCA AAGATGACCT CTACTTGATT
1501 CCCACAAATC ACAGGGAGCA AGAATAGCTT AATTTAATGG AGTTCTTGGA AGAATTAAAG
1561 AAGAAGGGCT ATATAGGTGA GATTTTTTGT ATGGTTGCA

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SEQ. ID. NO. 160

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1 MELQSSPFNL ISLFLFFSFL FILVKKWNK IPKLPPGPWR LPFIGSLHHL KGKLPHHNLR
61 DLARKYGPLM YLQLGEIPVV VISSPRVAKA VLKTHDLAFA TRPRFMSSDI VFYKSRDISF
121 APFGDYWRQM RKILTQELLS NKMLKSYSLI RKDELSKLLS SIRLETGS AV NINEKLLWFT
181 SCMTCRLAFG KICNDRDELI MLIREILTLS GGFDVGD LFP SWKLLHNMSN MKARLTNVHH
241 KYDLVMENII NEHQENHAAG IKGNNEFGGE DMIDALLRAK ENNELQFPPIE NDNMKAVILD
301 LFIAGTETSY TAIIWALSEL MKHPSVMAKA QAEVRKVFKE NENFDENDLD KLPYLKSVIK
361 ETLRMHPPVP LLGPRECRDQ TEIDGYTVPI KARVMVNAWA IGRDPESWED PESFKPERFE
421 NTSVDLTGNH YQFIPFGSGR RMCPCMSFGL VNTGHPLAQL LYCFDWKLPD KVNANDFRTT
481 ETSRVFAASK DDLYLIPTNH REQE

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NAME D98-AA1  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 161

```

1 CTTTCTTTCT TGTACCGAGA TGGAGTTTCA ACACTTGGTT TCGTTCTTGC TATTCATCTC
61 CTTTCATCTTT CTTCTAATTC AAAAATGGAG GAAATCGAAA AAGCTGCCAC CTGGTCCGTG
121 GAGGCTACCT ATTATTGGAA GTGTGCATCA CTTGACAAAGT GGAGTACCAC ATCGAGTTCT
181 CAGAAATTTA TCACAAAAAT TTGGCCCGAT CATGTACTTG CAGCTCGGGG AAGTTCCCAC
241 AGTAGTTGTA TCCTCCCCAC ACATGGCCAA ACAAATTTTA AAAACTCATG ACCTCGCTTT
301 TGCATCTAGG CCAGAAATCA TGATGGGAAA AATTATTTGC TACGATTGTA AGGACATTGC
361 CTTTTCCCCG TATGGTGATT ATTGGAGACA TATGCGTAAA TTGAGCACCT TGGAACTACT
421 TAGTGCCAAG ATGGTCAAGT CCTTCAGTCC AATTCGTCAA GATGAGCTCT CAAGTCTCCT
481 ATCATCCATT GAATCAATGG GAAATTTGCC AATCAACTTA GTAGAAAAAC TTTTATGGTT
541 TATGAATGCC GCGACATGTA GGTCAAGATT TGGGAAAGTG TGTAAGATC AAAAAAGAGTT
601 GATAACATTG ATTCAACGAG CAGAAATCAT ATCTGGTGGA TTCGAGCTGG CTGATTTGTT
661 CCCTTCGAAG AAGTTTCTAC ATGGTATTAG TGGGATGCGA TCTAAACTAA TGGAAAGCTCG
721 TAACAAGATA GACGCAGTCT TGGACAAATG TATCAATGTG CACAGAGAGA ATCGGGCAAA
781 TGGAAATAGT TGTAATGGTG AGTCTGGAAC TGTAATTTT ATCGATGTTT TTCTAAGGGT
841 CATGGAGAGT GGCGAATTAC CATTTCCGAT AGAAAATGAC AACATCAAAG CAGTTATTCT
901 TGACATGTTT GTAGCAGGAT CTGACACATC ATCTTCAACC GTTATTTGGG CATTAACAGA
961 AATGATGAAG AATCCAAAAG TCATGGCTAA AGCACAAGCT GAAGTGAGAG AAGCTTTTAA
1021 AGGAAAGAAA GCATGTGATG AGGATACTGA TCTTGAAAAG CTTCAATTACC TAAATTTAGT
1081 GATCAAAGAG ACACTCCGAT TACACCCTCC AACTCCTCTA CTTGTCCCGC GAGAATGCAG
1141 GGAGGAAACA GAGATAGAAG GATTCACTAT ACCATTGAAA AGCAAAGTCT TGGTTAACGT
1201 ATGGGCAATT GGAAGAGATC CCGAGAATTG GAAAAATCCT GAATGTTTTA TACCAGAGAG
1261 ATTCGAAAAT AGTTCTATTG AGTTTACTGG AAATCATTTT CAACTTCTTC CGTTTGGCGC
1321 TGGAAGACGA ATTTGTCCAG GAATGCAATT TGGTTTGGCT CTTGTTACTC TGCCATTGGC
1381 TCATTTGCTT CACAATTTTG ATTGGAAACT TCCCGAAGGA ATTAATGCAA GGGATTTGGA
1441 CATGACAGAG GCAAATGGGA TATCTGCTAG AAGAGAAAAA GATCTTTACT TGATTGCTAC
1501 TCCTTATGTA TCACCTCTTG ATTAATCTG AATTTTGGCT TTAATGCTGC TTGCTTGCTT
1561 CACT

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SEQ. ID. NO. 162

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1 MEFQHLVSFL LFISFIFLLI QKWRKSKKLP PGPWRLPIIG SVHHLTSGVP HRVLRNLSQK
61 FGPIMYLQLG EVPTVVVSSP HMAKQILKTH DLAFASRPEI MMGKIICYDC KDIAFSPYGD
121 YWRHMRKLST LELLSAKMVK SFSPIRQDEL SSLSSIESM GNLPINLVEK LLWFMNAATC
181 RSAFGKVCKD QKELITLIQR AESLSGGFEL ADLFPSKKFL HGISGMRSKL MEARNKIDAV
241 LDNIINVHRE NRANGNSCNG ESGTVDFIDV FLRVMESEGL PFPIENDNIK AVILDMFVAG
301 SDTSSSTVIW ALTEMMKNPK VMAKAQAEVR EAFKGGKACD EDTDLEKLHY LNLVIKETLR
361 LHPPTPLLVP RECREETEIE GFTIPLKSKV LVNVWAIGRD PENWKNPECF IPERFENSSI
421 EFTGNHFQLL PFGAGRRICP GMQFGLALVT LPLAHLHNF DWKLPEGINA RDLDMTEANG
481 ISARREKDLY LIATPYVSPL D

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NAME D98-AG1  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 163

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1 CTTTCTTGTA CCGAGATGGA GTTTC AACAC TTGGTTTCGT TCTTGCTATT CATCTCCTTC
61 ATCTTTCTTC TAATTC AAAA ATGGAGGAAA TCGAAAAAGC TGCCACCTGG TCCGTGGAGG
121 CTACCTATTA TTGGAAGTGT GCATCACTTG ACAAGTGGAG TACCACATCG AGTTCTCAGA
181 AATTTATCAC AAAAATTG GCGATCATG TACTTGCAGC TCGGGGAAGT TCCCACAGTA
241 GTTGTATCCT CCCCACACAT GGCCAAACAA ATTTTAAAAA CTCATGACCT CGCTTTTGCA
301 TCTAGGCCAG AAATCATGAT GGGAAAAATT ATTTGCTACG ATTGTAAGGA CATTGCCTTT
361 TCCCCGTATG GTGATTATTG GAGACATATG CGTAAATTGA GCACCTTGGA ACTACTTAGT
421 GCCAAGATGG TCAAGTCCTT CAGTCCAATT CGTCAAGATG AGCTCTCAAG TCTCCTATCA
481 TCCATTGAAT CAATGGGAAA TTTGCCAATC AACTTAGTAG AAAA ACTTTT ATGGTTTATG
541 AATGCCGCGA CATGTAGGTC AGCATTTGGG AAAGTGTGTA AAGATCAAAA AGAGTTGATA
601 ACATTGATTC AACGAGCAGA ATCATTATCT GGTGGATTCT AGCTGGCTGA TTTGTTCCCT
661 TCGAAGAAGT TTCTACATGG TATTAGTGGG ATGCGATCTA AACTAATGGA AGCTCGTAAC
721 AAGATAGACG CAGTCTTGGA CAACATTATC AATGTGCACA GAGAGAATCG GGCAAATGGA
781 AATAGTTGTA ATGGTGAGTC TGGA ACTGTA GATTTTCATCG ATGTTTTTCT AAGGGTCATG
841 GAGAGTGGCG AATTACCAT TCCGATAGAA AATGACAACA TCAAAGCAGT TATTCTTGAC
901 ATGTTTCGTAG CAGGATCTGA CACATCATCT TCAACCGTTA TTTGGGCATT AACAGAAACG
961 ATGAAGAATC CAAAAGTCAT GGCTAAAAGCA CAAGCTGAAG TGAGAGAAGC TTTTAAAGGA
1021 AAGAAAGCAT GTGATGAGGA TACTGATCTT GAAAAGCATC ATTACCTAAA TTTAGTGATC
1081 AAAGAGACAC TCCGATTACA CCCTCCA ACT CCTCTACTTG TCCCGCGAGA ATGCAGGGAG
1141 GAAACAGAGA TAGAAGGATT CACTATACCA TTGAAAAGCA AAGTCTTGGT TAACGTATGG
1201 GCAATTGGAA GAGATCCCGA GAATTGGAAA AATCCTGAAT GTTTTATACC AGAGAGATTC
1261 GAAAATAGTT CTATTGAGTT TACTGGAAAT CATTTTCAAC TTCTTCCGTT TGGCGCTGGA
1321 AGACGAATTT GTCCAGGAAT GCAATTTGGT TTGGCTCTTG TTA CTCTGCC ATTGGCTCAT
1381 TTGCTTCACA ATTTTGATTG GAACTTCCC GAAGGAATTA ATGCAAGGGA TTTGGACATG
1441 ACAGAGGCAA ATGGGATATC TGCTAGAAGA GAAAAAGATC TTTACTTGAT TGCTACTCCT
1501 TATGTATCAC CTCTTGATTA ACTCTGAAAT TTTGCTTTAA TGCTGCTTGC TTGCTTCACT

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SEQ. ID. NO. 164

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1 MEFQHLVSFL LFISFIFLLI QKWRKSKKLP PGPWRLPIIG SVHHLTSGVP HRVLRNLSQK
61 FGPIMYLQLG EVPTVVVSSP HMAKQILKTH DLAFASRPEI MMGKIICYDC KDIAFSPYGD
121 YWRHMRKLST LELLSAKMVK SFSPIRQDEL SLLSSIESM GNLPINLVEK LLWFMNAATC
181 RSAFGKVCKD QKELITLIQR AESLSGGFEL ADLFPSKKFL HGISGMRSKL MEARNKIDAV
241 LDNIINVHRE NRANGNSCNG ESGTVDFIDV FLRVMESGEL PFPIENDNIK AVILDMFVAG
301 SDTSSSTVIW ALTETMKNPV VMAKAQAEVR EAFKGGKACD EDTDLEKHHY LNLVIKETLR
361 LHPPTPLLVP RECREETEIE GFTIPLKSKV LVNVWAIGRD PENWKNPECF IPERFENSSI
421 EFTGNHFQLL PFGAGRRICP GMQFGLALVT LPLAHLHNF DWKLPEGINA RDLDMTEANG
481 ISARREKDLV LIATPYVSPL D

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NAME D100-BE2  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 165

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1 CAAAAACAAA ATTCCAATGG TTAACATGTT CACTCCAATT ATATACGCTC CTCTCCTTTT
61 AGCTTTTTTAC ATTATCACAA AACATTTCTT ACGCAAACCTC AGAAATAATC CACCAGCTCC
121 ATTTCTTACT TTCCCCTTTA TTGGCCATCT TTATCTCTTC AAAAAACCAC TTCAACGTAC
181 CTTAGCCAAA ATCTCCGAAC GTTATGGCTC TGTTCCTCTA CTCGAATTCG GTTCACGAAA
241 AGTACTTTTG GTTCTTTCAC CATCTGCAGC TGAAGAATGC TTAACAAAAA ACGATATTAT
301 TTTCGCGAAT CGTCCTCTTT TGATGGCTGG AAAACATCTT GGATATAATT TTACATCTTT
361 GGCTTGGAGT TCGTACGGAG ATCATTGGAG AAATCTGCGA AGGATTACTT CAGTTGAGAT
421 GTTTTCGACT CATCGTCTTC AAATGCTACA TGGGATTCGT ATTGATGAAG TGAAATCTAT
481 GGTTAAGAGG CTCAATTCCT CTGCCATAGC TGAAAAATCT GTGGATATGA AGTCTATGTT
541 TTTTGAGCTG ATGCTCAATG TTATGATGAG GACAATTGCT GGAAAAAGAT ATTACGGTGA
601 GAATGTGGAG GACATTGAGG AAGCTACGAG ATTCAAAGGT TTGGTGCAAG AGACTTTCAG
661 GATTGGCGGG GCGACGAATA TTGGCGACTT TTTGCCGGCG TTGAAGTTAT TGGTGAGGAA
721 ATTGGAGAAA AGTTTAATTG TGTGCAAGA GAACAGAGAT GAGTTTATGC AGGAATTAAT
781 TAAAGATTGC AGAAAAAGAA TGGAGAAAGA AGGTACTGTT ACTGATTCAG AAATTGAAGG
841 GAACAAGAAA TGTTTAATTG AAGTTTTGTT AACACTACAA GAAAATGAAC CGGAATACTA
901 CAAAGATGAA ATCATCAGAA GCCTTATGCT TGTTCATTA TCAGCTGGTA CAGATACTTC
961 AGTTGGGACA ATGGAATGGG CTTTATCATT AATGTTAAAC CACCCTGAAA CTCTGAAGAA
1021 AGCACAAGCT GAAATTGATG AACATATAGG ACATGAACGT TTAGTGGACG AGTCGGACAT
1081 CAACAACCTA CCTTACCTAC GTTGTATAAT CAACGAGACA TTCCGAATGT ACCCTGCAGG
1141 ACCACTACTA GTCCACACAG AGTCGTCAGA GGAAACCACC GTAGGAGGCT ACCGTGTACC
1201 CGGAGGAACC ATGTTACTTG TGAATTTGTG GGCAATTCAC AATGATCCAA AGCTATGGGA
1261 TGAACCAAGA AAGTTTAAAC CAGAAAGATT TCAAGGACTA GATGGTGTTA GAGATGGTTA
1321 CAAAATGATG CCTTTTGGTT CTGGACGAAG GAGTTGTCCT GGAGAAGGAT TGGCTGTTCTG
1381 AATGGTTGCC TTGTCATTGG GATGTATTAT TCAATGTTTT GATTGGCAAC GAATCGGCGA
1441 AGAATTGGTT GATATGACTG AAGGAACCTG ACTTACTTTG CCTAAAGCTC AACCTTTGGT
1501 GGCCAAAGTGT AGCCACGAC CTAAAATGGC TAATCTTCTC TCTCAGATTT GA

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SEQ. ID. NO. 166

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1 MVNMFPTPIY APLLLAFYII TKHFLRKLRN NPPAPFLTFP FIGHLYLFKK PLQRTLAKIS
61 ERYGSVLLLE FGSRKVLLVS SPSAAEECLT KNDIIFANRP LLMAGKHLGY NFTSLAWSSY
121 GDHWRNLRI TSVEMFSTHR LQMLHGIRID EVKSMVKRLN SSAIAEKSVD MKSMFFELML
181 NVMMRTIAGK RYYGENVEDI EEATRFKGLV QETFRIGGAT NIGDFLPALK LLVRKLEKSL
241 IVLQENRDEF MQELIKDCRK RMEKEGTVTD SEIEGNKKCL IEVLLTLQEN EPEYYKDEII
301 RSLMLVLLSA GTDTSVGTME WALSLMLNHP ETLKKAQAEI DEHIGHERLV DESDINNLPY
361 LRCIINETFR MYPAGPLLVP HESSEETTVG GYRVPGGTML LVNLWAIHND PKLWDEPRKF
421 KPERFQGLDG VRDGYKMMPF GSGRRSCPGE GLAVRMVALS LGCIIQCFDW QRIGEELVDM
481 TEGTGLTLPK AQPLVAKCSP RPKMANLLSQ I

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NAME D100A-AC3  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 167

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1 CAAAAACAAA ATTCCAATGG TTAACATGTT CACTCCAATT ATATACGCTC CTCTCCTTTT
61 AGCTTTTAC ATTATCACA AACATTTCTT ACGCAAACCTC AGAAATAACC CACCAGCTCC
121 ATTTCTTACT TTCCCCTTTA TTGGCCATCT TTATCTCTTC AAAAAACCAC TTCAACGTAC
181 CTTAGCCAAA ATCTCCGAAC GTTATGGCTC TGTTCTTCTA CTCGAATTCG GTTCACGAAA
241 AGTACTTTTG GTTTCTTCAC CATCTGCAGC TGAAGAATGC TTAACAAAAA ACGATATTAT
301 TTTGCGGAAT CGTCCTCTTT TGATGGCTGG AAAACATCTT GGATATAATT TTACTTCTTT
361 GGCTTGGAGT TCGTACGGAG ATCACTGGAG AAATCTTCGT AGGATTACTT CAGTTGAGAT
421 GTTTTCGACT CATCGTCTTC AAATGCTACA TGGAAATTCGT ATTGATGAAG TGAAATCTAT
481 GGTAAAGAGG CTCAATTCCCT CTGCCATAGC TGAAAAATCT GTGGATATGA AGTCTATGTT
541 TTTTGAGCTG ATGCTCAATG TTATGATGAG GACAATTGCT GGAAAAAGAT ATTACGGTGA
601 GAATGTGGAG GACATTGAGG AAGCTACGAG ATTCAAAGGT TTGGTGCAAG AGACTTTCAG
661 GATTGGCGGG GCGACGAATA TTGGCGACTT TTTGCCGGCG TTGAAGTTAT TGGTGAGGAA
721 ATTGGAGAAA AGTTTAATTG TGTTGCAAGA GAACAGAGAT GAGTTTATGC AGGAATTAAT
781 TAAAGATTGC AGAAAAAGAA TGGAGAAAAG AGGTACTGTT ACTGATTGAG AAATTGAAGG
841 GAACAAGAAA TGTTTAATTG AAGTTTGTGTT AACACTACAA GAAAATGAAC CGGAATACTA
901 CAAAGATGAA ATCATCAGAA GCCTTATGCT TGTTCTATTA TCAGCTGGTA CAGATACTTC
961 AGTTGGGACA ATGGAATGGG CTTTATCATT AATGTTAAAC CACCCTGAAA CTCTGAAGAA
1021 AGCACAAGCT GAAATTGATG AACATATAGG ACATGAACGT TTAGTGGACG AGTCGGACAT
1081 CAACAACCTA CCTTACCTAC GTTGATATAAT CAACGAGACA TTCCGAATGT ACCCTGCAGG
1141 ACCACTACTA GTCCACACAG AGTCGTCAGA GGAAACCACC GTAGGAGGCT ACCGTGTACC
1201 CGGAGGAACC ATGTTACTTG TGAATTTGTG GGCTATTAC AATGATCCAA AGCTATGGGA
1261 TGAACCAAGA AAGTTTAAGC CAGAAAGATT TGAAGGACTA GAAGGTGTTA GAGACGGTTA
1321 CAAAATGATG CCTTTTGGTT CTGGACGAAG GAGTTGTCCT GGAGAAGGAT TGGCTATTCG
1381 AATGGTTGCA TTGTCATTGG GATGTATTAT TCAATGCTTT GATTGGCAAC GACTTGGGGA
1441 AGGATTGGTT GATAAGACTG AAGGAACTGG ACTTACTTTG CCTAAAGCTC AACCTTTAGT
1501 GGCCAAGTGT AGCCCACGAC CTATAATGGC TAATCTTCTT TCTCAGATTT GAACATAATT
1561 GGTTCCTACC AAACATCCCC AAAC TAGAAT ATTATTATTG GTTACATATA CAATGTAATC
1621 AATTTTGAAC CATATTATAT CTCAATGTAT TCCTTTTAA AAAAAAAAAA AAAAA

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SEQ. ID. NO. 168

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1 MVNMFPTPIY APLLLAFYII TKHFLRKL RN NPPAPFLTFP FIGHLYLFKK PLQRTLAKIS
61 ERYGSVLLLE FGSRKVLLVS SPSAAEECLT KNDIIFANRP LLMAGKHLGY NFTSLAWSSY
121 GDHWRNL RRI TSVEMFSTHR LQMLHGIRID EVKSMVKRLN SSAIAEKSV D MKSMFFELML
181 NVMMRTIAGK RYYGENVEDI EEATRFKGLV QETFRIGGAT NIGDFLPALK LLVRKLEKSL
241 IVLQENRDEF MQELIKDCRK RMEKEGTVD SEIEGNKKCL IEVLLTLQEN EPEYYKDEII
301 RSLMLVLLSA GTDTSVGTME WALSLMLNHP ETLKKAQAEI DEHIGHERLV DESDINNLPY
361 LRCIINETFR MYPAGPLLVP HESSEETTVG GYRVPGGTML LVNLWAIHND PKLWDEPRKF
421 KPERFEGLEG VRDGYKMMPF GSGRRSCPGE GLAIRMVALS LGCIIQCFDW QRLGEGLV D K
481 TEGTGLTL PK AQPLVAKCSP RPIMANLLSQ I

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NAME D104A-AE8 (69,1755)  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 169

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1 CAACACGCTT ACTATCTCCT AAATCTCCAC TCAAAAACAA AGAAGAGAAA GATTTAAAC
61 TAATAATTAT GAAAGAGATG GTGCAAAACA ATATGAGCAC TTCTCTTCTT GAAACTTTAC
121 AAGCTACGCC CATGATATTC TACTTCATCG TCCCTCTCTT CTGCTTATTC CTTCTCTCCA
181 AATCTCGCCG TAAACGTTTG CCTCCAGGTC CAACTGGCTG GCCTCTCATT GGTAACATGA
241 TGATGATGGA CCAGTTAACT CACCGTGGCC TTGCCAAACT AGCCCCAAAA TATGGTGGTG
301 TTTTTCACCT TAAAATGGGT TATGTTTACA AAATTGTAGT CTCTGGTCCA GACGAAGCTC
361 GCCAAGTATT ACAGGAACAC GACATCATAT TTTCGAACCG TCCAGCGACC GTAGCCATAA
421 GTTACCTAAC ATATGACAGG GCAGACATGG CTTTTGCTGA CTATGGACTC TTCTGGCGGC
481 AGATGAGAAA ACTATGTGTA ATGAACTCT TCAGCCGCAA ACGAGCTGAG TCATGGGACT
541 CAGTTCGAGA CGAAGCGGAT TCCATGGTTA GAATTGTAAC AACCACACA GGCACAGCTG
601 TTAACCTAGG TGAACCTGTT TTCAGTCTCA CTCGTAATAT TATCTACAGA GCTGCTTTTG
661 GAACCTGTTC TGAAGATGGA CAAGGCGAGT TCATTAAAAT TATGCAAGAG TTTTCGAAGC
721 TATTTGGTGC TTCAATATA GCTGATTTTA TTCCATGGCT AGGCTGGGTT GGTAAGCAGA
781 GTCTAAATAT TAGACTTGCT AAGGCTAGAG CGTCGCTTGA TGGGTTCATT GATTTCGATTA
841 TTGATGACCA TATTATTAGA AAGAAAGCTT ATGTTAATGG CAAAATGAT GGAGGTGATC
901 GAGAAACTGA TATGGTGGAT GAGCTTTTAG CTTTTTACAG TGAGGAAGCA AAAGTAACTG
961 AGTCCGAAGA TTTGCAGAAT GCTATCAGAC TTACTAAGGA TAATATCAAA GCTATCATCA
1021 TGGATGTAAT GTTTGGAGGG ACAGAAACAG TGGCTTCTGC AATAGAATGG GCCATGGCAG
1081 AGCTTATGAG GAGTCCTGAA GATCTTAAAA AGGTACAACA AGAGCTGGCT AACGTTGTTG
1141 GACTCAACAG AAAAGTTGAA GAATCTGACT TTGAAAAATT AACATACTTA AGATGTTGTC
1201 TAAAAGAAAC TCTACGACTT CACCCTCCAA TCCCTCTCCT CCTCCATGAG ACCGCCGAGG
1261 AATCCACCGT CTCCGGCTAC CATATTCCGG CAAAGTCACA TGTTATTATA AATTCATTTG
1321 CCATTGGGCG TGACAAAAAT TCATGGGAAG ATCCTGAAAC TTATAAACCA TCTAGGTTTC
1381 TCAAAGAAGG TGTACCAGAT TTTAAAGGAG GTAATTTTGA GTTTATACCA TTTGGGTCGG
1441 GTCGGCGGTC TTGCCCCGGT ATGCAACTTG GGCTTTATGC ATTGGAAATG GCTGTGGCCC
1501 ATCTTCTTCA TTGTTTTACT TGGGAATTGC CAGATGGTAT GAAACCAAGT GAGCTTAAAA
1561 TGGATGATAT TTTTGGACTC ACTGCTCCAA GAGCTAATCG ACTCGTGGCT GTGCCTACTC
1621 CACGTTTGTT GTGTCCCTTT TATTAATTGA AGAAAAAGG TGGGGCTTTT ACTTGCATCA
1681 AAGAGTGGTG CTTGTGATTT TTCCACCTTT TGGTTAAATA TACGAATTAT TATGATATAC
1741 GAATTCTTGG GCACA

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SEQ. ID. NO. 170

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1 MKEMVQNMMS TSLLETQAT PMIFYFIVPL FCLFLLSKSR RKRLPPGPTG WPLIGNMMMM
61 DQLTHRGLAK LAQKYGGVFH LKMGYVHKIV VSGPDEARQV LQEHDIIFSN RPATVAISYL
121 TYDRADMAFA DYGLFWRQMR KLCVMKLFSS KRAESWDSVR DEADSMVRIV TTNTGTAVNL
181 GELVFSLTRN IYRAAFGTC SEDQGGEFIK IMQEFKSLFG AFNIADFI PW LGWVGKQSLN
241 IRLAKARASL DGFIDSIIDD HIIRKKAYVN GKNDGGDRET DMVDELLAFY SEEAKVTESE
301 DLQNAIRLTK DNIKAIIMDV MFGGTETVAS AIEWAMAEML RSPEDLKKVQ QELANVVGLN
361 RKVEESDFEK LTYLRCCLEKE TLRLHPPIPL LLHETAEEST VSGYHIPAKS HVIINSFAIG
421 RDKNWEDPE TYKPSRFLKE GVPDFKGGNF EFIFPGSGRR SCPGMQLGLY ALEMAVAHLL
481 HCFTWELPDG MKPSELKMDD IFGLTAPRAN RLVAVPTPRL LCPLY

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NAME D105-AD6  
ORGANISM NICOTIANA TABACUM  
SEQ. ID. NO. 171

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1 TGTGCTTGTG AGTGTGGGAG AAGGCCTTCA ATATGGAGAT ACCATATTAC AGCTTAAAAA
61 TTGCAATTTTTC TTCATTTGCA ATTATCTTTG TACTAAGATG GGCATGGAAA ATCTTGAATT
121 ATGTGTGGTT AAAACCAAAA GAATTGGAGA AATACCTCAG ACAGCAGGGT TTCAAAGGAA
181 ACTCTTACAA ATTCTTGTTT GGGGATATGA AAGAGATGAA GAAAATGGGT GAAGAAGCTA
241 TGTCTAAGCC AATCAATTTT TCTCATGACA TGATTTGGCC TAGAGTTATG CCATTCATCC
301 ACAAACCAT CACCAATTAT GGTAAGAATT GTATTGTGTG GTTTGGGCCA AGACCAGCAG
361 TCCTGATEAC AGACCCGGAA CTTGTAAAGG AGGTGCTAAC GAAGAATTTT GTCTATCAGA
421 AGCCGCTTGG CAATCCACTC ACAAAGTTGG CAGCAACTGG AATTGCAGGC TATGAAACAG
481 ATAAATGGGC TACACATAGA AGGCTTCTCA ATCCTGCTTT TCACCTTGAC AAGTTGAAGC
541 ATATGCTACC TGCATTCCAA TTTACTGCTA GTGAGATGTT GAGCAAATTG GAGAAAGTTG
601 TTTCAACAAA CGGAACAGAG ATAGATGTGT GGCCATATTT ACAAACCTTTG ACAAGTGATG
661 CCATTTC AAG AACTGCGTTT GGAAGTAGTT ATGAAGAAGG AAGAAAGATT TTTGACCTTC
721 AAAAAAGAACA ACTTTCAC TAATTCTAGAA TTTACGCGAC AATATATATT CCAGGATGGA
781 GGTTTTTTGCC AACGAAAAGG AACAAAAAGGA TGAAGCAAAT ATTTAATGAA GTACGAGCAC
841 TGGTATTTGG AATTATTAAG AAAAGGATGA GTATGATTGA AAATGGAGAA GCACCTGATG
901 ATTTATTGGG AATATTATTG GCATCCAATT TAAAAGAAAT CCAACAACAT GGAACAACA
961 AGAAATTTGG TATGAGTATT GATGAGGTGA TTGAAGAGTG TAAACTCTTC TATTTTGCTG
1021 GGCAAGAGAC TACTTCATCT TTAATTGTAT GGACTATGAT TTTGTTGTGC AAATATCCTA
1081 ATTGGCAAGA TAAAGCTAGA GAAGAGGTTT TGCAAGTGTT TGGGAGTAGG GAAGTTGACT
1141 ATGACAAGTT GAATCAGCTA AAAATAGTAA CTATGATCTT AAACGAGGTC TTAAGGTTGT
1201 ATCCAGCAGG ATATGTGATT AATCGAATGG TAAACAAAGA AACAAAGTTA GGAATTTGT
1261 GTTTACCAGC CGGCGTACAG CTCGTGTTAC CAACAATGTT GTTGCAACAT GATACTGAAA
1321 TATGGGGAGA TGATGCAATG GAGTTCAATC CAGAGAGATT TAGTGATGGA ATATCCAAAG
1381 CAACAAAAGG AAAACTTGTG TTTTTCAT TTAGTTGGGG TCCAAGAATA TGTATTGGGC
1441 AAAATTTTGC TATGTTAGAG GCTAAAATGG CAATGGCTAT GATTCTGAAA ACCTATGCAT
1501 TTGAACCTC TCCATCTTAT GCTCATGCTC CTCATCCACT ACTACTTCAA CCTCAATATG
1561 GTGCTCAATT AATTTTGTAC AAGTTGTAGA TATGGTCAAT TTGGAACCTG TTATGGAAC
1621 TTTATCATTG TAATCAACCA TATTGAGGGA ACATGGTTTG AGGTAAATC CTCGTGTGTG
1681 TGTC

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SEQ. ID. NO. 172

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1 MEIPYSLKI AISSFALIFV LRWAWKILNY VWLKPKELEK YLRQQGFKN SYKFLFGDMK
61 EMKKMGEEAM SKPINFSHDM IWPRVMPFIH KTITNYGKNC IVWFGPRPAV LITDPELVKE
121 VLTKNFVYQK PLGNPLTKLA ATGIAGYETD KWATHRRLN PAFHLDKLLH MLPAFQFTAS
181 EMLSKLEKVV SPNGTEIDVW PYLQTLTSDA ISRTAFGSSY EEGRKIFDLQ KEQLSLILEV
241 SRTIYIPGWR FLPTKRNRKM KQIFNEVRAL VFGIIKRMS MIENGEAPDD LLGILLASNL
301 KEIQQHGNK KFGMSIDEVI EECKLFYFAG QETTSSLLVW TMILLCKYPN WQDKAREEVL
361 QVFGSREVDY DKLNQLKIVT MILNEVLRLY PAGYVINRMV NKETKLG NLC LPAGVQLVLP
421 TMLLQHDTEI WGDDAMEFNP ERFSDGSKA TKGKLVFFPF SWGPRICIGQ NFAMLEAKMA
481 MAMILKTYAF ELSPSYAHAP HPLLLQPQYG AQLILYKL

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NAME D109-AH8 (14,1697)  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 173

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1 CCAGCACCAA GACATGGAGA ATTCCTGGGT AGTTTTAGCC TTAACAGGCC TTCTTACATT
61 AGTTTTTCTC TCAAAGTTTC TTCATAGTCC TCGTCGTAAA CAAAATCTTC CACCAGGTCC
121 AAAACCATGG CCTATTGTTG GCAATATACA TCTTCTTGGT TCCACCCCTC ACAGATCCCT
181 TCACGAACTT GCAAAAAGAT ACGGAGATTT AATGCTACTA AAGTTCGGTT CGCGCAATGT
241 CCTTATTTTA TCCTCCCCAG ATATGGCTAG AGAATTCTTG AAAACAAATG ATGCCATTG
301 GGCTTCTCGC CCTGAGCTTG CCGCTGGTAA ATATACTGCT TATAATTATT GCGACATGAC
361 ATGGGCACGT TATGGACCCT TTTGGAGACA AGCAAGGAGG ATCTATCTCA ACGAGATTTT
421 CAATCCTAAA CGTTTGGATT CATTTGAGTA CATTGCGATA GAGGAAAGGC ATAATTTGAT
481 TTCACGTCTT TTTGTTCTCT CTGGGAAGCC AATTCTTCTT AGAGACCATT TAACTCGGTA
541 CACTCTTACA AGTATAAGTA GAACAGTATT GAGTGGAAAA TATTTTAGCG AGTCACCTGG
601 CCAAAATTCa ATGATAACTT TGAAACAATT GCAGGATATG CTTGATAAGT GGTTTTTGGT
661 TAATGCTGTG ATCAATATTG GGGACTGGAT ACCTTGGCTT GCTTTCTTGG ATTTGCAAGG
721 TTATGTCAAG CAAATGAAGG AGTTGCATAG GAACTTCGAC AAATTTTATA ACTTTGTGCT
781 AGATGATCAC AAGGCTAATA GGGGAGAGAA GAACTTTGTG CCAAGAGACA TGGTCGATGT
841 TTTGCTGCAG CAAGCTGAGG ATCCTAATCT TGAGGTCAAA CTCACCAATG ATTGTGTCAA
901 GGGTCTAATG CAGGACTTAT TGGCTGGCGG CACGGACACC TCAGCAACAA CCGTTGAATG
961 GGCTTTTTAT GAACTTCTTA GACAACCTAA GATTATGAAG AAAGCACAAC AAGACCTAGA
1021 CCTTGTCTAT TCACAGGACA GATGGGTTCa AGAAAAAGAT TACACTCAAC TCCCTTACAT
1081 TGAGTCAATC ATCAAGGAAA CATTGAGGCT TCACCCAGTA AGCACCATGC TTCCACCGCG
1141 CATTGCCCTG GAGGATTGTC ATGTAGCAGG CTATGACATA CCTAAAGGTA CAATTTTAAT
1201 TGTGAACACT TGGAGTATTG GAAGAAATTC ACAGCATTGG GAGTCACCAG AAGAATTCCT
1261 TCCGGAGAGG TTTGAAGGGA AGAATATTGG TGTCACAGGA CAACATTTTG CGCTCTTGCC
1321 ATTTGGCGCG GGCCGGAGAA AGTGCCAGG ATACAGTCTT GGGATTGTA TAATTAGGGC
1381 AACTTTAGCT AACTTGTTGC ATGGATTCAA CTGGAGATTG CCTAATGGTA TGAGTCCAGA
1441 AGACATTAGC ATGGAAGAGA TTTATGGGCT AATTACACAC CCCAAAGTCG CACTTGACGT
1501 GATGATGGAG CCTCGACTTC CCAACCATCT TTACAAATAG TGGATAATTA AAACCATTAA
1561 AATCGTTTTG TTATATGCAT GTCTCATATT TGTAGTGGTC AAAATGTTTG TTTTCTATCA
1621 TGGATGTTCA GTGCGAGGTT GGGAAATTCA AGTCATTAAC GTGTGAAAT ATTTTAAATT
1681 TAAAAA AAAA
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SEQ. ID. NO. 174

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1 MENS WVVLAL TGLLTLVFLS KFLHSPRRKQ NLPPGPKPWP IVGNIHLLGS TPHRSLHELA
61 KRYGDLMLLK FGSRNVLILS SPDMAREFLK TNDAIWASRP ELAAGKYTAY NYCDMTWARY
121 GPFWRQARRI YLNEIFNPKR LDSFEYIRIE ERHNLISRLF VLSGKPILLR DHLTRYTLTS
181 ISRTVLGSKY FSSEPGQNSM ITLKQLQDML DKWFLLNGVI NIGDWIPWLA FLDLQGYVKQ
241 MKELHRNFDK FHNFLVDDHK ANRGEKNFVP RDMVDVLLQQ AEDPNLEVKL TNDVCVGLMQ
301 DLLAGGTDTS ATTVEWAFYE LLRQPKIMKK AQQELDLVIS QDRWVQEKDY TQLPYIESII
361 KETLRLHPVS TMLPPRIALE DCHVAGYDIP KGITILIVNTW SIGRNSQHWEE SPEEFLPERF
421 EGKNIGVTGQ HFALLPFGAG RRRKCPGYSLG IRIIRATLAN LLHGFNWRLP NGMSPEDISM
481 EEIYGLITHP KVALDVMMEP RLPNHLYK
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NAME D110-AF12 (166,1631)  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 175

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1 ACTGTTCAAA TCACAGTAAC AGCATCTTGT GCTGCCATAA TAATTACTCT AGTGGTGTGT
61 ATATGGAGAG TGCTGAATTG GGTFTGGTTC AGACCAAAGA AGCTGGAAAA GCTACTGAGG
121 AAACAAGGTC TCAAAGGCAA TTCCTACAGG ATTTTGTATG GGGATATGAA GGAGCTTTCT
181 GGTATGATTA AGGAAGCTAA CTCCAAACCC ATGAATCTTT CTGATGATAT TGCCCCAAGA
241 TTGGTCCCTT TCTTCTTGA TACCATCAAG AAATATGGGA AAAAATCCTT TGTATGGTTG
301 GGTCCAAAA CGCTGGTTTT TGTCATGGAC CCCGAGCTTA TAAAGGAAAGT ATTCTCCAAA
361 AACTATCTGT ATCAAAAGCC TCATTCAAAT CCATTAACCA AGTTACTGGC ACAAGGACTT
421 GTAAGCCAAG AGGAAGACAA ATGGGCCAAA CATAGAAAAA TCGTCACTCC TGCCTTCCAC
481 CTGGAGAAGC TAAAGCATAT GCTTCCAGCT TTTTGTTTGA GCTGTACTGA GATGCTGAGC
541 AAATGGGAAG ACATTGTTGC AGTTGAGGGC TCACATGAGA TAGATATATG GCCTGGCCTT
601 CAACAATTAA CTAGTGATGT GATCTCTCGG ACAGCCTTTG GCAGTAGCTA TGAAGCAGGT
661 AGAAGGATAT TTGAACTTCA AAAGGAACAA GCTCAATTTT TTATGGAAGC TATACGCTCC
721 GTTTATATTC CAGGCTGGAG GTTTTGGCCA ACAAAGAGGA ACAGAAGAA GTCAATGAAA
781 GAAAAGGATG TTCAAGCCTT AGTTAGAGGT ATTATTGATA AAAGAGTAAA GTCAATGAAA
841 GCAGGAGAGG TGAATAATGA GGATCTGCTT GGTATATTGC TGGAATCTAA TTTTAAAGAA
901 ATTGAACAGC ATGGAAACAA GGATTTTGGG ATGAGCATTG AAGAAGTCAT TCAAGAATGC
961 AAGTTATTCT ATTTTGCTGG CCAAGAAACT ACATCAGTGT TGCTTGTATG GACTCTAATA
1021 TTGCTGAGCA GGCATCAGGA TTGGCAAGCA CTGGCCAGAG AAGAGGTGTT GCAAGTCTTT
1081 GGAATCAGA AACCAGATTT TGATGGATTA AATCGTCTAA AAATTGTTAC AATGATCTTG
1141 TACGAGTCTT TAAGGCTCTA TCCCCAGTA GTGACACTTA CCCGAAGGCC TAAGGAAGAC
1201 ACTGTATTAG GAGATGTATC TCTACCAGCA GGTGTGTTAA TCTCCTTACC AGTGATCTTA
1261 TTGCATCAGC ACGAAGAGAT ATGGGGTAAA GATGCAAAGA AGTTCAAGCC AGAGAGATTC
1321 AGAGATGGAG TCTCAAGTGC AACAAAGGGT CAAGTCACTT TTTTCCCATT TACTTGGGGT
1381 CCCAGAATAT GCATTGGACA AAATTTTGCC ATGTTAGAAG CAAAGACTAC TTTGGCTATG
1441 ATCCTACAAC GCTTCTCCTT TGAAGTGTCT CCATCTTATG CACATGCTCC TCAGTCCATA
1501 ATAACCTTGC AACCCAGTA TGGTGCTCCA CTTATTTTGC ATAAAAATATA GTTTATTACT
1561 TGTAAGTAGT GTCTCGTTTT ATGTTAAGCA TGAGTCCAAA ATGTTAAGGC TTGTAGAAGT
1621 GCAAAATGGG A

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SEQ. ID. NO. 176

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1 MKELSGMIKE ANSKPMNLSD DIAPRLVPFF LDTIKKYGKK SFVWLGPKPL VFVMDPELIK
61 EVFSKNYLYQ KPHSNPLTKL LAQGLVSQEE DKWAKHRKIV TPAFHLEKLK HMLPAFCLSC
121 TEMLSKWEDI VAVEGSHEID IWPGLQQLTS DVISRTAFGS SYEAGRRIFE LQKEQAQFLM
181 EAIRSVYIPG WRFLPTKRNK RMKEIEKDVO ALVRGIIDKR VKSMKAGEVN NEDLLGILLE
241 SNFKEIEQHG NKDFGMSIEE VIQECKLFYF AGQETTSVLL VWTLLLSRH QDWQALAREE
301 VLQVFGNQKP DFDGLNRLKI VTMIYLESR LYPPVVTLTR RPKEDTVLGD VSLPAGVLIS
361 LPVILLHHDE EIWGKDAKKF KPERFRDGVN SATKGQVTFE PFTWGPRICI GQNFAMLEAK
421 TTLAMILQRF SFELSPSYAH APQSIITLQP QYGAPLILHK I

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NAME D112-AA5  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 177

```

1 ATTTATCTCT GAAAATGCAA TTCTTCAGCT TGGTTTCCAT TTTCCTATTC CTATCTTTCC
61 TATTTTGTGT GAGGAAATGG AAGAACTCCA ATAGCCAAAG CAAAAAATTG CCACCAGGTC
121 CATGGAAAAT ACCAATACTA GGAAGTATGC TTCATATGAT TGGTGGAGAA CCGCACCATG
181 TCCTTAGAGA TTTAGCCAAA AAAGATGGAC CACTTATGCA CCTTCAGTTA GGTGAAATTT
241 CTGCAGTTGT GGTTACTTCT AGGGACATGG CAAAAGAAGT GCTAAAAACT CATGACGTCG
301 TTTTGGCATC TAGGCCTAAA ATTGTAGCCA TGGACATTAT CTGTTATAAC CAGTCCGACA
361 TTGCCTTTAG CCCTTATGGC GACCACTGGA GACAAATGCG TAAAAATTTGT GTCATGGAAC
421 TTCTCAATGC AAAGAATGTT CGGTCTTTCA GCTCCATCAG ACGTGATGAA GTCGTTTCGTC
481 TCATTGACTC TATCCGGTCA GATTCTTCTT CAGGTGAGCT AGTTAAATTTT ACGCAGAGGA
541 TCATTGGGTT TGCAAGCTCC ATGACGTGTA GATCAGCATT TGGGCAAGTA CTCAAGGGGG
601 AAGACATATT TGCCAAAAAG ATCAGAGAAG TAATAGGATT AGCAGAAGGC TTTGATGTGG
661 TAGACATCTT CCCTACATAC AAGTTTCTTC ATGTTCTCAG TGGGATGAAG CGTAAACTTTT
721 TGAATGCCCA CCTTAAGGTA GACGCCATTG TTGAGGATGT CATCAACGAG CACAAGAAAA
781 ATCTTGCAGC TGGCAAGAGT AATGGCGCAT TAGGAGGCGA AGATCTAATT GATGTCCTAC
841 TGAGACTTAT GAATGACACA AGTCTTCAAT TTCCCATCAC CAACGACAAAT ATCAAAGCTG
901 TTGTTGTTGA CATGTTTGCT GCCGGAACAG AAACCTTCATC AACAACAACGT GTATGGGCCA
961 TGGCTGAAAT GATGAAGAAT CCAAGTGTAT TCGCCAAAGC TCAAGCAGAA GTGCGAGAAG
1021 CCTTTAGGGA CAAAGTATCT TTTGATGAAA ATGATGTGGA GGAGCTGAAA TACTTAAAGT
1081 TAGTCATTAA AGAACTTTG AGACTTCATC CACCGTCTCC ACTTTTGGTC CCAAGAGAAT
1141 GCAGGGAAGA TACGGATATA AACGGCTACA CTATTCCTGC AAAGACCAAA GTTATGGTTA
1201 ATGTTTGGGC ATTGGGAAGA GATCCAAAAT ATTGGGATGA CGCGGAAAGC TTTAAGCCAG
1261 AGAGATTGTA GCAATGTTCT GTAGATATTT TTGGTAATAA TTTTGAGTTT CTTCCTTTG
1321 GCGGGGGACG GAGAATTTGT CCTGGAATGT CATTGTTGTT AGCTAATCTT TACTTACCAT
1381 TGGCTCAATT ACTCTATCAC TTTGACTGGA AACTCCCAAC CGGAATCAAG CCAAGAGACT
1441 TGGACTTGAC CGAATTATCG GGAATAACTA TTGCTAGAAA GGGTGACCTT TACTTAAATG
1501 CTACTCCTTA TCAACCTTCT CGAGAGTAAT TTACTATTGG CATAAACATT TTAAATTTCC
1561 TTCATCAACC TC

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SEQ. ID. NO. 178

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1 MQFFSLVSIF LFLSFLFLLR KWKNSNSQSK KLPPGPWKIP ILGSMMLHMIG GEPHHVLRDL
61 AKKDGPLMHL QLGEISAVVV TSRDMAKEVL KTHDVVFASR PKIVAMDIIC YNQSDIAFSP
121 YGDHWRQMRK ICMELLNAK NVRSFSSIRR DEVVRLIDSI RSDSSSGELV NFTQRIIWFA
181 SSMTCRSAFG QVLKGQDIFA KKIREVIGLA EGFVDVVDIFP TYKFLHVLHG MKRKLNAHL
241 KVDAIVEDVI NEHKKNLAAK KSNALGGED LIDVLLRLMN DTSLQFPITN DNIKAVVDM
301 FAAGTETSST TTVWAMAEMM KNPSVFKAQ AEVREAFRDK VSFENDVEE LKYLKLVKE
361 TLRLHPPSPL LVPRECREDT DINGYTIPAK TKVMVNVWAL GRDPKYWDDA ESFKPERFEQ
421 CSVDIFGNNE EFLPFGGRR ICPGMSFGLA NLYLPLAQLL YHFDWKLPTG IKPRDLDLTE
481 LSGITIARKG DLYLNATPYQ PSRE

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NAME D120-AH4  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 179

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1 ATAATGCTTT CTCCCATAGA AGCCATTGTA GGACTAGTAA CCTTCACATT TCTCTTCTTC
61 TTCCTATGGA CAAAAAAATC TCAAAAACCT TCAAAAACCT TACCACCGAA AATCCCCGGA
121 GGATGGCCGG TAATCGGCCA TCTTTTCCAC TTCAATGACG ACGGCGACGA CCGTCCATTA
181 GCTCGAAAAAC TCGGAGACTT AGCTGACAAA TACGGCCCCG TTTTCACTTT TCGGCTAGGC
241 CTTCCCCTTG TCTTAGTTGT AAGCAGTTAC GAAGCTGTAA AAGACTGTTT CTCTACAAAT
301 GACGCCATTT TTTCCAATCG TCCAGCTTTT CTTTACGGCG ATTACCTTGG CTACAATAAT
361 GCCATGCTAT TTTTGGCCAA TTACGGACCT TACTGGCGAA AAAATCGAAA ATTAGTTATT
421 CAGGAAGTTC TCTCCGCTAG TCGTCTCGAA AAATTCAAAC ACGTGAGATT TGCAAGAATT
481 CAAGCGAGCA TTAAGAATTT ATATACTCGA ATTGATGGAA ATTTCGAGTAC GATAAATTTA
541 ACTGATTGGT TAGAAGAATT GAATTTTGGT CTGATCGTGA AGATGATCGC TGGAAAAAAT
601 TATGAATCCG GTAAAGGAGA TGAACAAGTG GAGAGATTTA AGAAAGCGTT TAAGGATTTT
661 ATGATTTTAT CAATGGAGTT TGTGTTATGG GATGCATTTT CAATTCCATT ATTTAAATGG
721 GTGGATTTTC AAGGGCATGT TAAGGCTATG AAAAGGACTT TTAAAGATAT AGATTCTGTT
781 TTTCAGAATT GGTTAGGGGA ACATATTAAT AAAAGAGAAA AAATGGAGGT TAATGCAGAA
841 GGGAATGAAC AAGATTTTCAT TGATGTGGTG CTTTCAAAAA TGAGTAATGA ATATCTTGGT
901 GAAGGTACT CTCTGATAC TGTCATTAAG GCAACGGTGT TTAGTTTGGT CTTGGATGCA
961 GCAGACACAG TTGCTCTTCA CATAAATTGG GGAATGGCAT TATTGATAAA CAATCAAAAG
1021 GCCTTGACGA AAGCACAAGA AGAGATAGAC ACAAAAAGTTG GTAAGGACAG ATGGGTAGAA
1081 GAGAGTGATA TTAAGGATTT GGTATACCTC CAAGCTATTG TTAAAGAAGT GTTACGATTA
1141 TATCCACCAG GACCTTTGTT AGTACCACAC GAAAATGTAG AAGATTGTGT TGTAGTGGGA
1201 TATCACATTC CTAAAGGGAC AAGATTATTC GCAAACGTCA TGAAACTGCT ACGTGATCCT
1261 AAACCTCTGGC CTGATCCTGA TACTTTTCGAT CCAGAGAGAT TCATTGCTAC TGATATTGAC
1321 TTTCGTGGTC AGTACTATAA GTATATCCCG TTTGGTTCTG GAAGACGATC TTGTCCAGGG
1381 ATGACTTATG CATTGCAAGT GGAACACTTA ACAATGGCAC ATTTGATCCA AGGTTTCAAT
1441 TACAGAACTC CAAATGACGA GCCCTTGGAT ATGAAGGAAG GTGCAGGCAT AACTATACGT
1501 AAGGTAAATC CTGTGGAAC TATAATAGCG CCTCGCCTGG CACCTGAGCT TTATTAAAAC
1561 CTAAGATCTT TCATCTTGGT TGATCATTTG ATAATACTCC TAAATGGATA TTCATTTACC
1621 TTTTATCAAT TAA

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SEQ. ID. NO. 180

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1 MLSPIEAIVG LVTFTFLFFF LWTKKSQKPS KPLPPKIPGG WPVIGHLFHF NDDGDDRPLA
61 RKLGLADKY GPVFTFRLGL PLVLVVSSYE AVKDCFSTND AIFS NRPAFL YGDYLGYNNA
121 MLFLANYGPY WRKNRKLVIQ EVLSASRLEK FKHVRFARIQ ASIKNLYTRI DGNSSSTINLT
181 DWLEELNFGI IVKMIAGKNI ESGKGDEQVE RFKKAFKDFM ILSMEFVLWD AFPIPLFKWV
241 DFQGHVKAMK RTFKDIDSVF QNWLGEHINK REKMEVNAEG NEQDFIDVVL SKMSNEYLGE
301 GYSRDTVICA TVFSLVLDAA DTVALHINWG MALLINNQKA LTKAQEEIDT KVGKDRWVEE
361 SDIKDLVYLQ AIVKEVLRLY PPGPLLVPHE NVEDCVVSGY HIPKGTRLF A NVMKLLRDPK
421 LWPDPTDFP ERFIATDIDF RGQYKYIIPF GSGRRSCPGM TYALQVEHLT MAHLIQGFNY
481 RTPNDEPLDM KEGAGITIRK VNPVELIAP RLAPELY

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NAME D121-AA8  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 181

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1 AATCCATAAT GCTTTCTCCC ATAGAAGCCA TTGTAGGACT AGTAACCTTC ACATTTCTCT
61 TCTTCTTCCT ATGGACAAAA AAATCTCAAA AACCTTCAAA ACCCTTACCA CCGAAAAATCC
121 CCGGAGGATG GCCGGTAATC GGCCATCTTT TCCACTTCAA TGACGACGGC GACGACCGTC
181 CATTAGCTCG AAAACTCGGA GACTTAGCTG ACAAATACGG CCCCCTTTTC ACTTTTCGGC
241 TAGGCCTTCC CCTTGCTTA GTTGTAAGCA GTTACGAAGC TGTAAGAGAC TGTTTCTCTA
301 CAAATGACGC CATTTTTTCC AATCGTCCAG CTTTTCTTTA CGGCGATTAC CTTGGCTACA
361 ATAATGCCAT GCTATTTTGT GCCAATTACG GACCTTACTG GCGAAAAAAT CGAAAATTAG
421 TTATTCAGGA AGTTCTCTCC GCTAGTCGTC TCGAAAAATT CAAACACGTG AGATTTGCAA
481 GAATTCGAAGC GAGCATTAAG AATTTATATA CTCGAATTGA TGGAAATTCG AGTACGATAA
541 ATTTAACTGA TTGGTTAGAA GAATTGAATT TTGGTCTGAT CGTGAAGATG ATCGCTGGAA
601 AAAATTATGA ATCCGCTAAA GGAGATGAAC AAGTGGAGAG ATTTAAGAAA GCCTTTAAGG
661 ATTTTATGAT TTTATCAATG GAGTTTGTGT TATGGGATGC ATTTCCAATT CCATTATTTA
721 AATGGGTGGA TTTTCAAGGG CATGTTAAGG CTATGAAAAG GACTTTTAAA GATATAGATT
781 CTGTTTTTCA GAATTGGTTA GAGGAACATA TTAATAAAAAG AGAAAAAATG GAGGTTAATG
841 CAGAAGGGAA TGAACAAGAT TTCATTGATG TGGTGCTTTC AAAAATGAGT AATGAATATC
901 TTGGTGAAGG TTAATCTCGT GATACTGTCA TTAAAGCAAC GGTGTTAGT TTGGTCTTGG
961 ATGCAGCAGA CACAGTTGCT CTTACATAA ATTGGGGAAT GGCATTATG ATAAACAATC
1021 AAAAGGCCTT GACGAAAGCA CAAGAAGAGA TAGACACAAA AGTTGGTAAG GACAGATGGG
1081 TAGAAGAGAG TGATATTAAG GATTTGGTAT ACCTCCAAGC TATTGTTAAA GAAGTGTAC
1141 GATTATATCC ACCAGGACCT TTGTTAGTAC CACACGAAAA TGTAAGAAGT TGTGTTGTTA
1201 GTGGATATCA CATTCCTAAA GGGACAAGAT TATTCGCAAA CGTCATGAAA CTGCAACGTG
1261 ATCCTAAACT CTGGTCTGAT CCTGATACTT TCGATCCAGA GAGATTCATT GCTACTGATA
1321 TTGACTTTCG TGGTCAGTAC TATAAGTATA TCCCCTTTGG TTCTGGAAGA CGATCTTGTC
1381 CAGGGATGAC TTATGCATTG CAAGTGAAC ACTTAACAAT GGCACATTTG ATCCAAGGTT
1441 TCAATTACAG AACTCCAAT GACGAGCCCT TGGATATGAA GGAAGGTGCA GGCATAACTA
1501 TACGTAAGGT AAATCCTGTG GAACTGATAA TAGCGCCTCG CCTGGCACCT GAGCTTTATT
1561 AAAACCTAAG ATCATCTTGC TTGAT

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SEQ. ID. NO. 182

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1 MLSPIEIVG LVTFTFLFFF LWTKKSQKPS KPLPPKIPGG WPVIGHLFHF NDDGDDRPLA
61 RKLGLADKY GPVFTFRLGL PLVLVVSSYE AVKDCFSTND AIFS NRPAFL YGDYLGYNNA
121 MLFLANYGPY WRKINRKLVIQ EVLSASRLEK FKHVRFARIQ ASIKNLYTRI DGNSSSTINLT
181 DWLEELNFGI IVKMIAGKNY ESGKGDEQVE RFKKAFKDFM ILSMEFVLWD AFPIPLFKWV
241 DFQGHVKAMK RTFKDIDSVF QNWLEEHINK REKMEVNAEG NEQDFIDVVL SKMSNEYLGE
301 GYSRDTVIKA TVFSLVLDAA DTVALHINWG MALLINNQKA LTQAQEEIDT KVGKDRWVEE
361 SDIKDLVYLQ AIVKEVLRLY PPGPLLVPHE NVEDCVVSGY HIPKGTRLFV NVMKLQRDPK
421 LWSDPDTFDP ERFIATDIDF RGQYYKYIBF GSGRRSCFGM TYALQVEHLT MAHLIQGFNY
481 RTPNDEPLDM KEGAGITIRK VNPVELIIP RLAPELY

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NAME D122-AF10  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 183

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1 CTAAAACTCC ATAATGGTTT CTCCCGTAGA AGCCATTGTA GGACTAGTAA CCCTTACACT
61 TCTCTTCTAC TTCCTATGGC CCAAAAAATT TCAAATACCT TCAAACCAT TACCACCGAA
121 AATTCCTCGGA GGGTGGCCGG TAATCGGCCA TCTTTCTAC TTCGATGATG ACGGCGACGA
181 CCGTCCATTA GCTCGAAAAC TCGGAGACTT AGCTGACAAA TACGGCCCCG TTTTCACTTT
241 CCGGCTAGGC CTTCCGCTTG TGTAAATTGT AAGCAGTTAC GAAGCTGTAA AAGACTGCTT
301 CTCTACAAAT GACGCCATTT TCTCCAATCG TCCAGCTTTT CTTTACGGTG AATACCTTGG
361 CTACAATAAT GCCATGCTAT TTTTGACAAA ATACGGACCT TATTGGCGAA AAAATAGAAA
421 ATTAGTCATT CAGGAAGTTC TCTCTGCTAG TCGTCTCGAA AAATTGAAGC ACGTGAGATT
481 TGGTAAAATT CAAACGAGCA TTAAGAGTTT ATACACTCGA ATTGATGGAA ATTTCGAGTAC
541 GATAAATCTA ACTGATTGGT TAGAAGAATT GAATTTTGGT CTGATCGTGA AAATGATCGC
601 TGGGAAAAAT TATGAATCCG GTAAAGGAGA TGAACAAGTG GAGAGATTTA GGAAGCGTA
661 TAAGGATTTT ATAATTTTAT CAATGGAGTT TGTGTTATGG GATGCTTTTC TAATTCCATT
721 GTTCAAATGG GTGGATTTTC AAGGCTATGT TAAGGCCATG AAAAGGACAT TTAAGGATAT
781 AGATTCTGTT TTTCAGAATT GGTTAGAGGA ACATGTCAAG AAAAGAGAAA AAATGGAGGT
841 TAATGCACAA GGGAATGAAC AAGATTTTCAT TGATGTGGTG CTTTCAAAAA TGAGTAATGA
901 ATATCTTGAT GAAGGTTACT CTCGTGATAC TGTCATAAAA GCAACAGTGT TTAGTTTGGT
961 CTTGGATGCT GCGGACACAG TTGCTCTTCA CATGAATTGG GGAATGGCAT TACTGATAAA
1021 CAATCAACAT GCCTTGAAGA AAGCACAAGA AGAGATCGAT AAGAAAAGTTG GTAAGGAAAG
1081 ATGGGTAGAA GAGAGTGATA TTAAGGATTT GGTCTACCTC CAAGCTATTG TTAAGAAGT
1141 GTTACGATTA TATCCACCAG GACCTTTATT AGTACCTCAT GAAAATGTAG AGGATTGTGT
1201 TGTTAGTGGA TATCACATTC CTAAAGGGAC TAGACTATTC GCGAACGTTA TGAAATTGCA
1261 GCGCGATCCT AAACCTCTGGT CAAATCCTGA TAAGTTTGAT CCAGAGAGAT TCTTCGCTGA
1321 TGATATTGAC TACCGTGGTC AGCACTATGA GTTTATCCCA TTTGGTTCTG GAAGACGATC
1381 TTGTCCGGGG ATGACTTATG CATTACAAGT GGAACACCTA ACAATAGCAC ATTTGATCCA
1441 GGGTTTCAAT TACAAAACCT CAAATGACGA GCCCTTGGAT ATGAAGGAAG GTGCAGGATT
1501 AACTATACGT AAAGTAAATC CTGTAGAAAGT GACAATTACG GCTCGCCTGG CACCTGAGCT
1561 TTATTAAAAC CTTAGATGTT TTATCTTGAT TGTACTAATA TATATATGCA GAAAAAATTG

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SEQ. ID. NO. 184

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1 MVSPVEAIVG LVTLTLLFYF LWPKKFQIPS KPLPPKIPGG WPVIGHLFYF DDDGDDRPLA
61 RKLGLADKY GPVFTFRLGL PLVLIVSSYE AVKDCFSTND AIFS NRPAFL YGEYLGYNNA
121 MLFLTKYGPY WRKNRKLVIQ EVLSASRLEK LKHVRFGKIQ TSIKSLYTRI DGNSSSTINLT
181 DWLEELNFGL IVKMIAGKNY ESGKGDEQVE RFRKAYKDFI ILSMEFVLWD AFPIPLFKWV
241 DFQGYVKAMK RTFKDIDSFV QNWLEEHVKK REKMEVNAQG NEQDFIDVVL SKMSNEYLDE
301 GYSRDTVIAK TVFSLVLDAA DTVALHMNWG MALLINNQHA LKKAQEEIDK KVGKERWVEE
361 SDIKDLVYLQ AIVKEVLRLY PPGPLLVPHE NVEDCVVSGY HIPKGTRLFA NVMKLQRDPK
421 LWSNPDKFDP ERFFADDIDY RGQHYEFIPF GSGRRSCPGM TYALQVEHLT IAHLIQGFNY
481 KTPNDEPLDM KEGAGLTIRK VNPVEVTITA RLAPELY

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NAME D128-AB7  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 185

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1 CGAGGCTCCC CACCAAAAAA TCATTTCTCT CGTCTAAAAT GGATCTTCTC TTACTAGAGA
61 AGACCTTAAT TGGTCTTTTC TTTGCCATTT TAATCGCTTT AATTGTCTCT AAACCTTCGTT
121 CAAAGCGTTT TAAGCTTCCT CCAGGACCAA TTCCAGTACC AGTTTTTGGT AATTGGCTTC
181 AAGTTGGTGA TGATTTAAAC CACAGAAATC TTACTGATTA TGCCAAAAAA TTTGGCGATC
241 TTTTCTTGTT AAGAATGGGT CAACGTAACT TAGTTGTTGT GTCATCTCCT GAATTAGCTA
301 AAGAAAGTTT ACACACACAA GGTGTTGAAT TTGGTTCAAG AACAAAGAAAT GTTGTGTTTG
361 ATATTTTAC TGGAAAAGGT CAAGATATGG TTTTACTGT ATATGGTGAA CATTGGAGAA
421 AAATGAGGAG AATTATGACT GTACCATTTT TTACTAATAA AGTTGTGCAA CAGTATAGAG
481 GGGGGTGGGA GTTTGAGGTG GCAAGTGTA TTTGAGGATGT GAAAAAAAAT CCTGAATCTG
541 CTACTAATGG GATCGTATTA AGGAGGAGAT TACAATTAAT GATGTATAAT AATATGTTTA
601 GGATTATGTT TGATAGGAGA TTTGAGAGTG AAGATGATCC TTTGTTTGT AAGCTTAAGG
661 CTTTGAATGG TGAAAGGAGT AGATTGGCTC AAAGTTTGA GTATAATTAT GGTGATTTTA
721 TTCCAATTTT GAGGCCTTTT TTGAGAGGTT ATTTGAAGAT CTGTAAAGAA GTTAAGGAGA
781 AGAGGCTGCA GCTTTTCAA GATTACTTTG TTGATGAAAG AAAGAAGCTT TCAAATACCA
841 AGAGCTCGGA CAGCAATGCC CTAAAATGTG CGATTGATCA CATTCTTGAG GCTCAACAGA
901 AGGGAGAGAT CAATGAGGAC AACGTTCTTT ACATTGTTGA AAACATCAAT GTTGCTGCAA
961 TTGAAACAAC ATTATGGTCA ATTGAGTGGG GTATCGCCGA GCTAGTCAAC CACCCTCACA
1021 TCCAAAAGAA ACTGCGCGAC GAGATTGACA CAGTTCTTGG ACCAGGAGTG CAAGTGA CTG
1081 AACCAGACAC CCACAAGCTT CCATACCTTC AGGCTGTGAT CAAGGAGGCA CTTCGTCTCC
1141 GTATGGCAAT TCCTCTATTA GTCCCACACA TGAACCTTCA CGACGCAAAG CTTGGCGGGT
1201 TTGATATTCC AGCAGAGAGC AAAATCTTGG TTAACGCTTG GTGGTTAGCT AACACC CGG
1261 CTCATTGGAA GAAACCCGAA GAGTTCAGAC CCGAGAGGTT CTTTGAAGAG GAGAAGCATG
1321 TTGAGGCCAA TGGCAATGAC TTCAGATATC TTCCGTTTGG CGTTGGTAGG AGGAGCTGCC
1381 CTGGAATTAT ACTTGCAATG CCAATTCTTG GCATCACTTT GGGACGTTTG GTTCAGAACT
1441 TTGAGCTGTT GCCTCCTCCA GGCCAGTCGA AGCTCGACAC CACAGAGAAA GGTGGACAGT
1501 TCAGTCTCCA CATTTTGAAG CATTCCACCA TTGTGTTGAA ACCAAGGTCT TTCTGA ACTT
1561 TGTGATCTTA TTAATTAAGG GGTTCTGAAG AAATTTGATA GTGTTGGATA TTAAGGCGCA
1621 ATT

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SEQ. ID. NO. 186

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1 MDLLLLLEKTL IGLFFAILIA LIVSKLRSKR FKLPPGPIPV PVFGNWLQVG DDLNHRNLTD
61 YAKKFGDLFL LRMGQRNLVV VSSPELAKEV LHTQGVFEGS RTRNVVFDIF TGKGQDMVFT
121 VYGEHWRKMR RIMTVPFFTN KVVQYRGGW EFEVASVIED VKKNPESATN GIVLRRRLQL
181 MMYNNMFRIM FDRRFESEDD PLFVKLKALN GERSRLAQSF EYNYGDFIPI LRPFLRGYLK
241 ICEVKEKRL QLFKDYFVDE RKKLSNTKSS DSNALKCAID HILEAQKQGE INEDNVLYIV
301 ENINVAAIET TLWSIEWGIA ELVNHPIQK KLRDEIDTVL GPGVQVTEPD THKLPYLQAV
361 IKEALRLRMA IPLLVPHMNL HDAKLG GFDI PAESKILVNA WWLANNPAAHW KKPEEFRPER
421 FFEEEKHVEA NGNDFRYLPF GVGRRSCPGI ILALPILGIT LGRLVQNFEL LPPPGQSKLD
481 TTEKGGQFSL HILKHSTIVL KPRSF

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NAME D129-AD10  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 187

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1 CAACACGCTT ACTATCTCCT AAATCTCCAC TCAAAAACAA AGAAGAGAAA GATTTAA AAC
61 TAATAATTAT GAAAGAGATG GTGCAAAACA ATATGAGCAC TTCTCTTCTT GAAACTTTAC
121 AAGCTACGCC CATGATATTC TACTTCATCG TCCCTCTCTT CTGCTTATTC CTTCTCTCCA
181 AATCTCGCCG TAAACGTTTG CCTCCAGGTC CAACTGGCTG GCCTCTCATT GGTAACATGA
241 TGATGATGGA CCAGTTAACT CACCGTGGCC TTGCCAAACT AGCCCCAAAA TATGGTGGTG
301 TTTTTCACCT TAAAATGGGT TATGTTTACA AAATTGTAGT CTCTGGTCCA GACGAAGCTC
361 GCCAAGTATT ACAGGAACAC GACATCATAT TTTCGAACCG TCCAGCGACC GTAGCCATAA
421 GTTACCTAAC ATATGACAGG GCAGACATGG CTTTTGCTGA CTATGGACTC TTCTGGCGGC
481 AGATGAGAAA ACTATGTGTA ATGAAACTCT TCAGCCGCAA ACGAGCTGAG TCATGGGACT
541 CAGTTCGAGA CGAAGCGGAT TCCATGGTTA GAATTGTAAC AACCAACACA GGCACAGCTG
601 TTAACCTAGG TGAACCTGTT TTCAGTCTCA CTCGTAATAT TATCTACAGA GCTGCTTTTG
661 GAACTTGTTT TGAAGATGGA CAAGGCGAGT TCATTGAAAT TATGCAAGAG TTTTCGAAGC
721 TATTTGGCGC TTTCAATATA GCTGATTTTA TTCCATGGCT AGGGTGGGTT GGTAAGCAGA
781 GTCTAAATAT TAGACTTGCT AAGGCTAGAG CGTCGCTTGA TGGGTTTATT GATTTCGATTA
841 TTGATGACCA TATTATTAGA AAGAAAGCTT ATGTTAATGG CAAAAATGAT GGAGGTGATC
901 GAGAACTGA TATGGTGGAT GAGCTTTTAG CTTTTTACAG TGAGGAAGCA AAAGTAACTG
961 AGTCCGAAGA TTTGCAGAAT GCTATCAGAC TTACTAAGGA TAGTATCAAA GCTATCATCA
1021 TGGATGTAAT GTTTGGAGGG ACAGAAACAG TGGCTTCTGC AATAGAATGG GCCATGGCAG
1081 AGCTTATGAG GAGTCCTGAA GATCTTAAAA AAGTACAACA AGGGCTGGCT AACGTGTTG
1141 GACTCAACAG AAAAGTTGAA GAATCTGACT TTGAAAAATT AACATACTTA AGATGTTGTC
1201 TAAAAGAAAC TCTACGACTT CACCTCCAA TCCCTCTCCT CCTCCATGAG ACCGCCGAGG
1261 AATCCACCGT CTCCGGCTAC CATATTCCGG CAAAGTCACA TGTATTATA AATTCATTTG
1321 CCATTGGGCG TGACAAAAAT TCATGGGAAG ATCCTGAAAC TTATAAACCA TCTAGGTTTC
1381 TCAAAGAAGG TGTACCAGAT TTAAAGGAG GTAATTTTGA GTTTATACCA TTTGGGTCGG
1441 GTCGGCGGTC TTGCCCCGGT ATGCAACTTG GGCTTTATGC ATTGGAAATG GCTGTGGCCC
1501 ATCTTCTTCA TTGTTTACT TGGGAATTGC CAGATGGTAT GAAACCAAGT GAGCTTAAAA
1561 TGGATGATAT TTTTGACTC ACTGCTCCAA GAGCTAATCG ACTCGTGGCT GTGCCTACTC
1621 CACGCTTGTT GTGTCCCCTT TATTAATTGA AGAAAAAGG TGGGGCT

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SEQ. ID. NO. 188

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1 MKEMVQNNMS TSLLETQAT PMIFYFIVPL FCLFLLSKSR RKRLPPGPTG WPLIGNMMM
61 DQLTHRGLAK LAQKYGGVFH LKMGYVHKIV VSGPDEARQV LQEHDIIFS RPTVAISYL
121 TYDRADMAFA DYGLFWRQMR KLCVMKLSR KRAESWDSVR DEADSMVRIV TTNTGTAVNL
181 GELVFSLTRN IYRAAFGTC SEDQGGEFIE IMQEFSLFG AFNIADFIPW LGWVGKQSLN
241 IRLAKARASL DGFIDSIIDD HIIRKKAYVN GKNDGGDRET DMVDELLAFY SEEAKVTESE
301 DLQNAIRLTK DSIKAIIMDV MFGGTETVAS AIEWAMAELM RSPEDLKKVQ QGLANVVGLN
361 RKVEESDFEK LTYLRCCLE TLRLHPP IPL LLHETAEEST VSGYHIPAKS HVIINSFAIG
421 RDKNWEDPE TYKPSRFLKE GVPDFKGNF EFIPFGSGRR SCPGMQLGLY ALEMAVAHLL
481 HCFTWELPDG MKPSELKMD IFGLTAPRAN RLVAVPTPRL LCPLY

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NAME D135-AE1  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 189

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1 GGGGGATAAG AATATGGAGA TACCATATTA CAGCTTAAAA CTTACAATTT TTTCATTTGC
61 AATTATCTTT GTACTAAGAT GGGCATGGAA AATCTTGAAT TATGTGTGGT TAAAACCAAA
121 AGAATTGGAG AAATGCATCA GACAGCAGGG TTTCAAAGGA AACTCTTACA AATTCTTGTT
181 TGGGGATATG AAAGAGATAA AGAAAAATGGG TGAAGAAGCT ATGTCTAAGC CAATCAATTT
241 CTCTCATGAC ATGATTTGGC CTAGAGTCAT GCCCTTCATC CACAAAACCA TCACCAATTA
301 TGGTAAGAAT TGTTTTGTGT GGTTTGGGCC AAGACCAGCA GTCCTGATCA CAGACCCGGA
361 ACTTGTAAG GAGGTGCTAA CGAAGAATTT CGTTTATCAG AAGCCACCTG GCACTCCACT
421 CACAAAATTG GCAGCAACTG GAATTGCAGG CTATGAAACA GATAAATGGG CTACACATAG
481 AAGGCTTCTC AATCCTGCTT TTCACCTTGA CAAGTTGAAG CATATGCTAC CTGCATTCCA
541 ATTTACTGCT TGTGAGATGT TGAGCAAATT GGAGAAAAGT GTCTCACCAA ATGGAACAGA
601 GATAGATGTG TGGCCATATC TACAACTTT AACAAAGTAT GCCATTTCAA GAACTGCTTT
661 TGGCAGTAGT TATGAAGAAG GAAGAAAGCT TTTTGAAGT CAAAAGGAAC AACTTTCAC
721 AATTCTAGAA GTGTCCCGCA CAATATACAT CCCAGGATGG AGGTTTTTGC CAACAAAAG
781 GAACAAAAGG ATGAAGCAAA TATTTAATGA AGTACGAGCG CTGGTATTGG GAATTATTAA
841 GAAAAGATTG AGTATGATTG AAAATGGAGA AGCTCCTGAT GATTTATTGG GTATATTATT
901 GGCATCCAAT TTAAGAGAAA TCCAACAACA TGGAAATAAC AAGAAATTTG GTATGAGTAT
961 TGATGAGGTG ATTGAAGAGT GTAAACTCTT CTATTTTGGC GGGCAAGAGA CAACTTCATC
1021 TTTACTTGTA TGGACTATGA TTTTGTGTGT CAAACATCCT AGTTGGCAAG ATAAAGCTAG
1081 AGAAGAGGTT TTGCAAGTGT TTGGAAGTAG GGAAGTTGAC TATGACAAGT TGAATCAGCT
1141 AAAAATAGTA ACTATGATCT TAAACGAGGT CTTAAGGTTG TATCCAGCAG GATATGCGAT
1201 TAATCGAATG GTAACCAAAG AAACAAAGTT AGGGAATTTA TGTTTACCAG CTGGGGTACA
1261 ACTCTTGTTA CCAACAATTT TGTTGCAACA TGATACTGAA ATATGGGGAG ATGATGCAAT
1321 GGAGTTCAAT CCAGAGAGAT TTAGTGATGG AATATCCAAA GCAACAAAAG GAAAACCTGT
1381 GTTCTTTCCA TTTAGTTGGG GTCCAAGAAAT ATGTATTGGG CAAAATTTTG CTATGTTAGA
1441 GGCCAAGATG GCAATGGCTA TGATTCTGAA AACTATGCA TTTGAAGTCT CTCCATCTTA
1501 TGCTCATGCT CCTCATCCAC TACTACTTCA ACCTCAATAT GGTGCTCAAT TAATTTTGTA
1561 CAAGTTGTAG AAATGGTCAA TTTGGAAGTT GTTATGGAAC TTTTATCATC GTAATCAACC

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SEQ. ID. NO. 190

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1 MEIPYYSKLK TIFSFAIIFV LRWAWKILNY VWLKPKELEK CIRQQGFKGN SYKFLFGDMK
61 EIKKMGEEM SKPINFSHDM IWPRVMPFIH KTITNYGKNC FVWFGPRPAV LITDPELVKE
121 VLTKNFVYQK PPGTPLTKLA ATGIAGYETD KWATHRRLN PAFHLDKLLH MLPAPQFTAC
181 EMLSKLEKVV SPNGTEIDVW PYLQTLTSDA ISRTAFGSSY BEGRKLFELQ KEQLSLILEV
241 SRTIYIPGWR FLPTKRNRKM KQIFNEVRAL VLGIIKKRLS MIENGEAPDD LLGILLASNL
301 KEIQQHGNK KFGMSIDEVI BECKLFYFAG QETTSSLLVW TMILLCKHPS WQDKAREEVL
361 QVFGSREVDY DKLNQLKIVT MILNEVLRLY PAGYAINRMV TKETKLGKLC LPAGVQLLLP
421 TILLQHDTEI WGDDAMEFNP ERFSDGISKA TKGKLVFFPF SWGPRICIGQ NFAMLEAKMA
481 MAMILKNYAF ELSPSYAHAP HPLLLQPQYG AQLILYKL

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NAME D141-AD7  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 191

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1  GTCCTAACTA AAAATGGAGA TTCAGTTTTC TAACTTAGTT GCATTCTTGC TCTTTCTCTC
61 CAGCATCTTT CTTCTATTCA AAAAATGGAA AACCAGAAAA CTAAATTTGC CTCCTGGTCC
121 ATGGAAATTA CCTTTTATTG GAAGTTTACA CCATTTGGCT GTGGCAGGTC CACTTCCTCA
181 CCATGGCCTA AAAAATTTAG CCAAACGCTA TGGTCCTCTT ATGCATTTAC AACTTGGACA
241 AATTCCTACA CTCATCATAT CATCACCTCA AATGGCAAAA GAAGTACTAA AAACTCACGA
301 CCTCGCTTTT GCCACTAGAC CAAAGCTTGT CGTGGCCGAC ATCATTCACT ACGACAGCAC
361 GGACATAGCA TTTTCTCCGT ACGGTGAATA CTGGAGACAA ATTCGTAAAA TTTGCATATT
421 GGAACCTCTG AGTGCCAAGA TGGTCAAATT TTTTAGCTCG ATTCGCCAAG ATGAGCTCTC
481 GAAGATGCTC TCATCTATAC GAACGACACC CAATCTTACA GTCAATCTTA CTGACAAAAAT
541 TTTTTGGTTT ACGAGTTCGG TAACCTGTAG ATCAGCTTTA GGGAAAGATAT GTGGTGACCA
601 AGACAAATTG ATCATTTTTA TGAGGGAAAT AATATCATTG GCAGGTGGAT TTAGTATTGC
661 TGATTTTTTC CCTACATGGA AAATGATTCA TGATATTGAT GGTTCGAAAT CTAAACTGGT
721 GAAAGCACAT CGTAAGATTG ATGAAATTTT GGGAAATGTT GTTGATGAGC ACAAAAAGAA
781 CAGAGCAGAT GGCAAGAAGG GTAATGGTGA ATTTGGTGGT GAAGATTTGA TTGATGTATT
841 GTTAAGAGTT AGAGAAAGTG GAGAAGTTCA AATTCCTATC ACAAATGACA ATATCAAATC
901 AATATTAATC GACATGTTCT CTGCGGGATC TGAACATCA TCGACGACTA TAATTTGGGC
961 ATTAGCTGAA ATGATGAAGA AACCAAGTGT TTTAGCAAAG GCACAAGCTG AAGTAAGGCA
1021 AGCTTTGAAG GAGAAAAAAG GTTTTCAACA GATTGATCTT GATGAGCTAA AATATCTCAA
1081 GTTAGTAATC AAAGAAACCT TAAGAATGCA CCCTCCAATT CCTCTATTAG TTCCTAGAGA
1141 ATGTATGGAG GATACAAAGA TTGATGGTTA CAATATACCT TTCAAACAA GAGTCATAGT
1201 TAATGCATGG GCAATCGGAC GAGATCCAGA AAGTTGGGAT GACCCCGAAA GCTTTATGCC
1261 AGAGAGATTT GAGAATAGTT CTATTGACTT TCTTGAAAT CATCATCAGT TTATACCATT
1321 TGGTGCAGGA AGAAGGATTT GTCCGGGAAT GCTATTGGT TTAGCTAATG TTGGACAACC
1381 TTTAGCTCAG TTACTTTATC ACTTCGATTG GAAACTCCCT AATGGACAAA GTCATGAGAA
1441 TTTTCGACATG ACTGAGTCAC CTGGAATTTT TGCTACAAGA AAGGATGATC TTGTTTTGAT
1501 TGCCACTCCT TATGATTCTT ATTAAGCAGT AGCAGAAATA AAAAGCCGGG GCAAACAGAA
1561 AAAAGT

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SEQ. ID. NO. 192

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1  MEIQFSNLVA FLLFLSSIFL LFKKWKTRKL NLPPGPWKLP FIGSLHHLAV AGPLPHHGLK
61 NLAKRYGPLM HLQLGQIPTL IISSPQMAKE VLKTHDLAFA TRPKLVVADI IHYDSTDIAF
121 SPYGEYWRQI RKICILELLS AKMVKFFSSI RQDELSKMLS SIRTTPNLTV NLTDKIFWFT
181 SSVTCRSALG KICGDQDKLI IFMREIISLA GGFSIADFFP TWKMIHDIDG SKSKLVKAHR
241 KIDEILGNVV DEHKKNRADG KKGNGEFGGE DLIDVLLRVR ESGEVQIPIT NDNIKSILID
301 MFSAGSETSS TTIIWALAEM MKKPSVLAKA QAEVRQALKE KKGFFQIDLD ELKYLKLVIK
361 ETLRMHPPIP LLVPRECMED TKIDGYNIPF KTRVIVNAWA IGRDPESWDD PESFMPERFE
421 NSSIDFLGNH HQFIFFGAGR RICPGMLFGL ANVGQPLAQL LYHFDWKLPN GQSHENFDMT
481 ESPGISATRK DDLVLIATPY DSY

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NAME D147-AD3  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 193

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1  CAACTAACAA ACACATTGAG TCCTCTCCCA AATCACTGAT TCACCACCAA AAGTACCAAC
61 AATTCAATGG AAGGTACAAA CTTGACTACA TATGCAGCAG TATTTCTTGA TACTCTGTTT
121 CTTTTGTTCC TTTCCAAACT TCTTCGCCAG AGGAAACTCA ATTTACCTCC AGGCCCAAAA
181 CCATGGCCGA TCATCGGAAA CTAAACCTT ATTGGCAATC TTCCTCATCG CTCAATCCAC
241 GAACTCTCCC TCAAGTACGG ACCCGTTATG CAACTCCAAT TCGGGTCTTT CCCCCTTGTA
301 GTTGGATCCT CCGTCGAAAT GGCTAAGATT TTCCTCAAAT CCATGGATAT TAACTTTGTA
361 GGCAGGCCTA AAACGGCTGC CGGAAAATAC ACAACGTACA ATTATTCCGA TATTACATGG
421 TCTCCTTACG GACCATATTG GCGCCAGGCA CGTAGGATGT GCCTAACGGA ATTATTCAGC
481 ACGAAACGTC TCGATTGATA CGAGTATATT CGGGCTGAGG AGTTGCATTC TCTTCTCCAT
541 AATTTGAACA AAATATCAGG GAAACCAATT GTGTTGAAAAG ATTATTCGAC GACGTTGAGT
601 TTAAATGTTA TTAGCAGGAT TGACTGGGG AAAAGGTATT TGGACGAATC CGAGAAGCTCG
661 TTCGTGAATC CTGAGGAATT TAAGAAGATG TTGGACGAAT TGTTTTTGCT AAATGGTGA
721 CTTAATATTG GAGATTCAAT TCCATGGATT GATTTTCATG ATTTGCAAGG TTATGTTAAG
781 AGGATGAAAG TAGTGAGCAA GAAATTCGAC AAGTTTTTAG AGCATGTTAT TGATGAGCAT
841 AACATTAGGA GAAATGGAGT GGAGAATTAT GTTGCTAAGG ATATGGTGGA TGTTTTGTTG
901 CAGCTCGCTG ATGATCCGAA GTTGGAAGTT AAGCTGGAGA GACATGGAGT CAAAGCATTC
961 ACTCAGGATA TGCTGGCTGG TGGAAACCGAG AGTTCAGCAG TGACAGTGGA GTGGGCAATT
1021 TCAGAGCTGC TAAAGAAGCC GGAGATTTTC AAAAAGGCTA CAGAAGAATT GGATCGAGTA
1081 ATTGGGCAGA ATAGATGGGT ACAAGAAAAG GACATTCCAA ATCTTCCTTA CATAGAGGCA
1141 ATAGTCAAAG AGACTATGCG ACTGCACCCC GTGGCACCAA TGTTGGTGCC ACGTGAGTGT
1201 CGAGAAGATA TTAAGGTAGC AGGCTACGAC GTTCAGAAAG GAACTAGGGT TCTCGTGAGT
1261 GTATGGACTA TTGGAAGAGA CCCTACATTG TGGGACGAGC CTGAGGTGTT CAAGCCGGAG
1321 AGATTCCATG AAAGGTCCAT AGATGTTAAA GGACATGATT ATGAGCTTTT GCCATTTGGA
1381 GCGGGGAGAA GAATGTGCCC GGGTATAGC TTGGGGCTCA AGGTGATTCA AGCTAGCTTA
1441 GCTAATCTTC TACATGGATT TAACTGGTCA TTGCCTGATA ATATGACTCC TGAGGACCTC
1501 AACATGGATG AGATTTTTTG GCTCTCTACA CCTAAAAAAT TTCCAATTGC TACTGTGATT
1561 GAGCCAAGAC TTTCACCAA ACTTTACTCT GTTTGATTCA GCAGTTCTAT GGTTCGCTCA
1621 AGATAGACTT TGTTACGTTT GAACCTGTGC TC

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SEQ. ID. NO. 194

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1  MEGTNLTTYA AVFLDTLFL FLSKLLRQRK LNLPPGPKPW PIIGNLNLIG NLPHRSIHEL
61 SLKYGPVMQL QFGSFPVVVG SSVEMAKIFL KSMDINFVGR PKTAAGKYTT YNYSBITWSP
121 YGPYWRQARR MCLTELFSTK RLDSYEYIRA EELHSLHLNL NKISGKPIVL KDYSTTSLN
181 VISRMVLGKR YLDESENSFV NPEEFKKMLD ELFLNLGVNL IGDSIPWIDF MDLQGYVKRM
241 KVVSKKFDKF LEHVIDEHNI RRNGVENYVA KDMVDVLLQL ADDPKLEVKL ERHGVKAFTQ
301 DMLAGGTESS AVTVEWAISE LLKKPEIFKK ATEELDRVIG QNRWVQEKDI PNLPYIEAIV
361 KETMRLHPVA PMLVPRECRE DIKVAGYDVQ KGTRVLVSVW TIGRDP TLWD EPEVFKPERF
421 HERSIDVKGH DYELLPFAG RRMCPGYSLG LKVIQASLAN LLHGFNWSLP DNMTPEDLNM
481 DEIFGLSTPK KFPLATVIEP RLSPKLYSV

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NAME D163-AF12  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 195

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1 CTTCTTCCTT CCTAACTAAA AATGGAGATT CAGTTTTCTA ACTTAGTTGC ATTCTTGCTC
61 TTTCTCTCCA GCATCTTTCT TGTATTCAAA AAATGGAAAA CCAGAAAAC TAAATTTGCCT
121 CCTGGTCCAT GGAAATTACC TTTTATTGGA AGTTTACACC ATTTGGCTGT GGCAGGTCCA
181 CTTCTCACC ATGGCCTAAA AAATTTAGCC AAACGCTATG GTCCTCTTAT GCATTTACAA
241 CTTGGACAAA TTCCTACACT CGTCATATCA TCACCTCAAA TGGCAAAAGA AGTACTAAAA
301 ACTCACGACC TCGCTTTTGC CACTAGACCA AAGCTTGTCG TGGCCGACAT CATTCACTAC
361 GACAGCACGG ACATAGCATT TTCGCCATAC GGTGAATACT GGAGACAAAT TCGTAAAATT
421 TGCATATTGG AACTCTTGAG TGCCAAGATG GTCAAGTTT TTAGCTCGAT TCGCCAAGAT
481 GAGCTCTCGA AGATGGTTTC ATCTATACGA ACGACGCCCA ATCTTCCAGT CAATCTTACC
541 GACAAGATTT TTTGGTTTAC GAGTTCGGTA ATTTGTAGAT CAGCTTTAGG GAAGATATGT
601 GGTGACCAAG ACAAATTGAT CATTTTTATG AGGGAAATAA TATCATTGGC AGGTGGATTT
661 AGTATTGCTG ATTTTTTCCC TACATGGAAA ATGATTCATG ATATTGATGG TTCAAATCT
721 AAACGGTGA AGGCACATCG TAAGATTGAT GAAATTTTGG AAAATGTGGT AAATGAGCAC
781 AAACAGAATC GAGCAGATGG TAAAAAGGGT AATGGTGAAT TTGGTGGAGA AGATCTGATT
841 GATGTTTTGT TAAGAGTTAG AGAAAGTGGA GAAGTTCAAA TTCCAATCAC AGATGACAAT
901 ATCAAATCAA TATTAATCGA CATGTTCTCT GATGAAGAAA CCGGATCGG AAACATCATC GACAACATA
961 ATTTGGGCAT TAGCTGAAAT GATGAAGAAA CCAAGTGTTT TAGCAAAGGC ACAAGCTGAA
1021 GTGAGGCAAG CTTTGAAGGG GAAGAAAATT AGTTTTCAAG AGATTGATAT TGATAAGCTA
1081 AAGTATTTGA AGTTAGTGAT CAAAGAAACT TTAAGAATGC ACCCTCCAAT TCCTCTGTTA
1141 GTCCCTAGAG AATGTATGGA AGATACAAAG ATTGATGGTT ACAATATACC TTTCAAAACA
1201 AGAGTCATTG TTAATGCATG GGCAATTGGA CGAGATCCTC AAAGTTGGGA TGATCCTGAA
1261 AGCTTTACGC CAGAGAGATT TGAGAATAAT TCTATTGATT TTCTTGGAAA TCATCATCAA
1321 TTTATTCCAT TTGGTGAGG AAGAAGGATT TGTCCTGGAA TGCTATTTGG TTTAGCTAAT
1381 GTTGGACAAC CTTTAGCTCA GTTACTTTAT CACTTCGATT GGAAACTCCC TAATGGACAA
1441 AGTCATGAGA ATTTGACAT GACTGAGTCA CCTGGAATTT CTGCTACAAG AAAGGATGAT
1501 CTTGTTTTGA TTGCCACTCC TTATGATTCT TATTAAGCAG TAGCAGAAAT AAAAAGCCGG
1561 GGCAACAGA AAAAAGTATT GCTGCTTCTA GGTATTTTCT ATTGGATAAA TTTCAAATTT
1621 CATCCACAAT ATTTAGTGTT TGCTAGAGTT GGTTAGC

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SEQ. ID. NO. 196

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1 MEIQFSNLVA FLLFLSSIFL VFKKWKTRKL NLPPGPWKLP FIGSLHHLAV AGPLPHHGLK
61 NLAKRYGPLM HLQLGQIPTL VISSPQMAKE VLKTHDLAFA TRPKLVVADI IHYDSTDIAF
121 SPYGEYWRQI RKICILELLS AKMVKFSSI RQDELSKMVS SIRTTPNLPV NLTDKIFWFT
181 SSVICRSALG KICGDQDKLI IFMREIISLA GGFSIADFFP TWKMIHDIDG SKSKLVKAHR
241 KIDEILENVV NEHKQNRADG KKGNGEFGGE DLIDVLLRVR ESGEVQIPIT DDNIKSILID
301 MFSAGSETSS TTIIWALAEM MKKPSVLAKA QAEVRQALKG KKISFQEIDI DKLKYLKLV
361 KETLRMHPPI PLLVPRECME DTKIDGYNIP FKTRVIVNAW AIGRDPQSWD DPESFTPERF
421 ENNSIDFLGN HHQFIPFGAG RRICPGMLFG LANVGQPLAQ LLYHFDWKLP NGQSHENFDM
481 TESPGISATR KDDLVLIA TP YDSY

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NAME D163-AG11  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 197

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1 CTTCTTCCTT CCTAACTAAA AATGGAGATT CAGTTTTCTA ACTTAGTTGC ATTCTTGCTC
61 TTTCTCTCCA GCATCTTTCT TGTATTCAAA AAATGGAAAA CCAGAAAACT AAATTTGCCT
121 CCTGGTCCAT GGAAATTACC TTTTATTGGA AGTTTACACC ATTTGGCTGT GGCAGGTCCA
181 CTTCTTCACC ATGGCCTAAA AAATTTAGCC AAACGCTATG GTCCTCTTAT GCATTTACAA
241 CTTGGACAAA TTCCTACACT CGTCATATCA TCACCTCAA TGGCAAAAGA AGTACTAAAA
301 ACTCACGACC TCGCTTTTGC CACTAGACCA AAGCTTGTCG TGGCCGACAT CATTCACTAC
361 GACAGCACGG ACATAGCACT TTCGCCATAC GGTGAATACT GGAGACAAAT TCGTAAAATT
421 TGCATATTGG AACTCTTGAG TGCCAAGATG GTCAAGTTTT TTAGCTCGAT TCGCCAAGAT
481 GAGCTCTCGA AGATGGTTTC ATCTATACGA ACGACGCCCC ATCTTCCAGT CAATCTTACC
541 GACAAGATTT TTTGGTTTAC GAGTTCGGTA ATTTGTAGAT CAGCTTTAGG GAAGATATGT
601 GGTGACCAAG ACAAATTGAT CATTTTTATG AGGGAAATAA TATCATTGGC AGGTGGATTT
661 AGTATTGCTG ATTTTTTCCC TACATGGAAA ATGATTTCATG ATATTGATGG TTCAAAATCT
721 AAACAGGAGA AGGCACATCG TAAGATTGAT GAAATTTTGG AAAATGTGGT AAATGAGCAC
781 AAACAGAATC GAGCAGATGG TAAAAAGGGT AATGGTGAAT TTGGTGGAGA AGATCTGATT
841 GATGTTTTGT TAAGAGTTAG AGAAAGTGGA GAAGTTCAA TTCCAATCAC AGATGACAAT
901 ATCAAATCAA TATTAATCGA CATGTTCTCT GCCGGATCGG AAACATCATC GACAACTATA
961 ATTTGGGCAT TAGCTGAAAT GATGAAGAAA CCAAGTGTTT TAGCAAAGGC ACAAGCTGAA
1021 GTGAGCCAAG CTTTGAAGGG GAAGAAAATT AGTTTTCAAG AGATTGATAT TGATAAGCTA
1081 AAGTATTTGA AGTTAGTGAT CAAAGAAACT TTAAGAATGC ACCCTCCAAT TCCTCTGTTA
1141 GTCCCTAGAG AATGTATGGA AGATACAAAG ATTGATGGTT ACAATATACC TTTCAAACA
1201 AGAGTCATTG TTAATGCATG GGCAATTGGA CGAGATCCTC AAAGTTGGGA TGATCCTGAA
1261 AGCTTTACGC CAGAGAGATT TGAGAATAAT TCTATTGATT TTCTTGGAAA TCATCATCAA
1321 TTTATTCCAT TTGGTGCAGG AAGAAGGATT TGTCCTGGAA TGCTATTTGG TTTAGCTAAT
1381 GTTGGACAAC CTTTAGCTCA GTTACTTTAT CACTTCGATT GGAAACTCCC TAATGGACAA
1441 ACTCACCAAA ATTTGACAT GACTGAGTCA CCTGGAATTT CTGCTACAAG AAAGGATGAT
1501 CTTATTTTGA TTGCCACTCC TGCTCATTCT TGATTAAGTA TTGCTGCTTT TCTATTGGAG
1561 AATTTTCAA ATTCTATCCAC AATATATAGT GTTTGCTAGA GTTGGTTAGC

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SEQ. ID. NO. 198

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1 MEIQFSNLVA FLLFLSSIFL VFKKWKTRKL NLPPGPWKLP FIGSLHHLAV AGPLPHHGLK
61 NLAKRYGPLM HLQLGQIPTL VISSPQMAKE VLKTHDLAFA TRPKLVVADI IHYDSTDIAL
121 SPYGEYWRQI RKICILELLS AKMKVFFSSI RQDELSKMVS SIRTTPNLPV NLTDKIFWFT
181 SSVICRSALG KICGDQDKLI IFMREIISLA GGFSIADFFP TWKMIHDIDG SKSKLVKAHR
241 KIDEILENVV NEHKQNRADG KKGNGEFGGE DLIDVLLRVR ESGEVQIPIT DDNIKSILID
301 MFSAGSETSS TTIIWALAEM MKKPSVLAKA QAEVSQALKG KKISFQEIDI DKLKYLKLV
361 KETLRMHPII PLLVPRECME DTKIDGYNIP FKTRVIVNAW AIGRDPQSWD DPESFTPERF
421 ENNSIDFLGN HHQFIPFGAG RRICPGMLFG LANVGQPLAQ LLYHFDWKLP NGQTHQNFDM
481 TESPGISATR KDDLILITP AHS

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NAME D163-AG12  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 199

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1 ATCCTTCTTC CTTCCTAGGT CCTAACTAAA AATGGAGATT CAGTTTTCTA ACTTAGTTGC
61 ATTCTTGCTC TTTCTCTCCA GCATCTTTCT TCTATTCAAA AAATGGAAAA CCAGAAAAC
121 AAATTTGCCCT CCTGGTCCAT GGAAATTACC TTTTATTGGA AGTTTACACC ATTTGGCTGT
181 GGCAGGTCCA CTTCCTCACC ATGGCCTAAA AAATTTAGCC AAACGCTATG GTCCTCTTAT
241 GCATTTACAA CTTGGACAAA TTCTTACACT CATCATATCA TCACCTCAAA TGGCAAAAAGA
301 AGTACTAAAA ACTCACGACC TCGCTTTTGC CACTAGACCA AAGCTTGTCG TGGCCGACAT
361 CATTCACTAC GACAGCACGG ACATAGCATT TTCTCCGTAC GGTGAATACT GGAGACAAAT
421 TCGTAAAAAT TGCATATTGG AACTCTTGAG TGCCAAGATG GTCAAATTTT TTAGCTCGAT
481 TCGCCAAGAT GAGCTCTCGA AGATGCTCTC ATCTATACGA ACGACACCCA ATCTTACAGT
541 CAATCTTACT GACAAAATTT TTTGGTTTAC GAGTTCGGTA ACTTGATAGT CAGCTTTAGG
601 GAAGATATGT GGTGACCAAG ACAAATTGAT CATTTTATG AGGGAAATAA TATCATTGGC
661 AGGTGGATTT AGTATTGCTG ATTTTTCCTC TACATGGAAA ATGATTCATG ATATTGATGG
721 TTCGAAATCT AAACGGTGA AAGCACATCG TAAGATTGAT GAAATTTTGG GAAATGTTGT
781 TGATGAGCAC AAAAAGAACA GAGCAGATGG CAAGAAGGGT AATGGTGAAT TTGGTGGTGA
841 AGATTTGATT GATGTATTGT TAAGAGTTAG AGAAAGTGGA GAAGTTCAAA TTCCTATCAC
901 AAATGACAAT ATCAAATCAA TATTAATCGA CATGTTCTCT GCGGGATCTG AAACATCATC
961 GACGACTATA ATTTGGGCAT TAGCTGAAAT GATGAAGAAA CCAAGTGTTT TAGCAAAGGC
1021 ACAAGCTGAA GTAAGGCAAG CTTTGAAGGA GAAAAAAGGT TTTCAACAGA TTGATCTTGA
1081 TGAGCTAAAA TATCTCAAGT TAGTAATCAA AGAAACCTTA AGAATGCACC CTCCAATTCC
1141 TCTATTAGTT CCTAGAGAAT GTATGGAGGA TACAAAGATT GATGGTTACA ATATACCTTT
1201 CAAAAACAAGA GTCATAGTTA ATGCATGGGC AATCGGACGA GATCCAGAAA GTTGGGATGA
1261 CCCCAGAAAGC TTTATGCCAG AGAGATTGGA GAATAGTTCT ATTGACTTTC TTGGAAATCA
1321 TCATCAGTTT ATACCATTG GTGCAGGAAG AAGGATTTGT CCGGGAATGC TATTTGGTTT
1381 AGCTAATGTT GGACAACCTT TAGCTCAGTT ACTTTATCAC TTCGATTGGA AACTCCCTAA
1441 TGGACAAAGT CATGAGAATT TCGACATGAC TGAGTCACCT GGAATTTCTG CTACAAGAAA
1501 GGATGATCTT GTTTTGATTG CCACTCCTTA TGATTCTTAT TAAGCAGTAG CAGAAATAAA
1561 AAGCCGGGGC AAACAGAAAA AAGTATTGCT GCTTCTAGGT ATTTTCTATT GGATAAATTT
1621 CAAAATTCAT CCACAATATT TAGTGTTTGC TAGAGTTGGT TAGC

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SEQ. ID. NO. 200

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1 MEIQFSNLVA FLLFLSSIFL LFKKWKTRKL NLPPGPWKLP FIGSLHHLAV AGPLPHHGLK
61 NLAKRYGPLM HLQLGQIPTL IISSPQMAKE VLKTHDLAFA TRPKLVVADI IHYDSTDIAF
121 SPYGEYWRQI RKICILELLS AKMVKFFSSI RQDELSKMLS SIRTTPNLTV NLTDKIFWFT
181 SSVTCRSALG KICGDQDKLI IFMREIISLA GGFSIADFFP TWKMIHDIDG SKSKLVKAHR
241 KIDEILGNV DEHKKNRADG KKGNGEFGGE DLIDVLLRVR ESGEVQIPIT NDNIKSILID
301 MFSAGSETSS TTIIWALAEM MKKPSVLAKA QAEVRQALKE KKGFFQIDLD ELKYLKLVK
361 ETLRMHPPIP LLVPRECMED TKIDGYNIPF KTRVIVNAWA IGRDPESWDD PESFMPERFE
421 NSSIDFLGNH HQFIPFGAGR RICPGMLFGL ANVGQPLAQL LYHFDWKLPN GQSHENFDMT
481 ESPGISATRK DDLVLIATPY DSY

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NAME D205-BG9  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 201

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1 TTCTTATTTT GATTCAACCA TGGAGAACCA ATACTCCTAC TCATTCTCTT CCTACTTCTA
61 CTTAGCTATA GTACTGTTTC TTCTTCCAAT TTTGGTCAAA TATTTCTTCC ATCGGAGAAG
121 AAATTTACCT CCAAGTCCAT TTTCTCTTCC AATAATTGGT CACCTTTACC TTCTCAAGAA
181 AACTCTCCAT CTCACTCTAA CATCCTTATC AGCTAAATAT GGTCTGTTT TATACCTCAA
241 ATTGGGCTCT ATGCCTGTGA TTGTTGTGTC CTCACCATCT GCTGTTGAAG AATGTTTAAAC
301 CAAGAATGAT ATCATATTCG CAAATAGGCC CAAGACCGTG GCTGGTGACA AGTTTACCTA
361 CAATTATACT GTTTATGTTT GGGCACCCCTA TGGCCAACCTT TGGAGAATTC TFCGCCGATT
421 AACTGTCGTT GAACTCTTCT CTTCACATAG CCTACAGAAA ACTTCTATCC TTAGAGATCA
481 AGAAGTTGCA ATATTTATCC GTTCGTTATA CAAATTCTCA AAGGATAGTA GCAAAAAAGT
541 CGATTTGACC AACTGGTCTT TTACTTTGGT TTTCAATCTT ATGACCAAAA TTATTGCTGG
601 GAGACATATT GTGAAGGAGG AAGATGCTGG CAAGGAAAAG GGCATTGAAA TTATTGAAAA
661 ACTTAGAGGG ACTTTCTTAG TAACTACATC ATTCTTGAAT ATGTGTGATT TCTTGCCAGT
721 ATTCAGGTGG GTTGGTTACA AAGGGCTGGA GAAGAAGATG GCCTCAATTC ACAATAGAAG
781 AAATGAATTC TTGAACAGCT TGCTTGATGA ATTTGACAC AAGAAAAGTA GTGCTTCACA
841 ATCTAACACA ACTGTTGGAA ACATGGAGAA GAAAACCACA CTGATTGAAA AGCTCTTGTC
901 TCTTCAAGAA TCAGAGCCTG AATTCTACAC TGATGATATC ATCAAAAGTA TTATGCTGGT
961 AGTTTTTGTG GCAGGAACAG AGACCTCATC AACAACCATC CAATGGGTAA TGAGGCTTCT
1021 TGTAGCTCAC CCTGAGGCAT TGTATAAGCT ACGAGCTGAC ATTGACAGTA AAGTTGGGAA
1081 TAAGCGCTTG CTGAATGAAT CAGACCTCAA CAAGCTTCCG TATTTGCATT GTGTTGTAA
1141 TGAGACAATG AGATTATACA CTCCGATACC ACTTTTATTG CCTCATTATT CAACTAAAGA
1201 TTGTATTGTG GAAGGATATG ATGTACCAA ACATACAATG TTGTTTGTC ACGCTTGGGC
1261 CATTACAGG GATCCCAAGG TATGGGAGGA GCCTGACAAG TTCAAGCCAG AGAGATTTGA
1321 GGCAACAGAA GGGGAAACAG AAAGGTTCAA TTACAAGCTT GTACCATTG GAATGGGGAG
1381 AAGAGCGTGC CCTGGAGCTG ATATGGGGTT GCGAGCAGTT TCTTTGGCAT TAGGTGCACT
1441 TATTCATGC TTTGACTGGC AAATTGAGGA AGCGGAAAGC TTGGAGGAAA GCTATAATTC
1501 TAGAATGACT ATGCAGAAC AGCCTTTGAA GGTGTCTGC ACTCCACGCG AAGATCTTGG
1561 CCAGCTTCTA TCCCAACTCT AAGGCAATTT ATCAATGCCA AACGTAATCT TCATCTACCA
1621 CTATG

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SEQ. ID. NO. 202

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1 MENQYSYSFS SYFYLAIVLF LLPILVKYFF HRRRLPPSP FSLPIIGHLY LLKKTLLHLTL
61 TSLSAKYGPV LYLKLGSMVP IVVSSPSAVE ECLTKNDIIF ANRPKTVAGD KFTYNYTVYV
121 WAPYQLWRI LRRLTVVELF SSHSLQKTSI LRDQEVAFI RSLYKFSKDS SKKVDLTNWS
181 FTLVFNLMTK IIAGRHIKVE EDAGKEKGIE IIEKLRGTFL VTTSFLNMCD FLPVFRWVGY
241 KGLEKKMASI HNRRNEFLNS LLDEFRRHKS SASQSNNTVG NMEKKTTLIE KLLSLQSESE
301 EFTDDIIS IMLVVFVAGT ETSSTTIQWV MRLLVAHPEA LYKL RADIDS KVG NKRL LNE
361 SDLNKLPYLH CUVVNETMRLY TPIPLLLPHY STKDCIVEGY DVPKHTMLFV NAWAIHRDPK
421 VWEEDPKFKP ERFEATEGET ERFNYKLVPF GMGRRACPGA DMGLRAVSLA LGALIQCQFDW
481 QIEEAESLEE SYNSRMTMQN KPLKVCTPR EDLGQLLSQL

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NAME D207-AA5  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 203

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1 AACCAACCTT CCTTTTCTTA CTTAGTAAAA TGGATATTCA GTCTTCTCCT TTCAACTTAA
61 TTGCTTTGCT ACTCTTCATT TCATTTCCTT TTATCCTATT GAAAAAGTGG AATACCAAAA
121 TCCCAAAGTT ACCTCCAGGT CCATGGAGAC TTCCCCTTAT TGGCAGCCTC CATCACTTGA
181 AAGGTAAACT CCCACACCAT CATCTTAGAG ATTTAGCCCG AAAATATGGA CCTCTCATGT
241 ATTTACAAC TGGAGAAGTT CCTGTAGTTG TAATATCTTC GCCACGTATA GCAAAAAGCTG
301 TACTAAAAAC TCATGATCTT GCTTTTGCAA CGAGGCCTCG GTTCATGTCC TCGGACATTG
361 TGTTTTACAA AAGCAGGGAC ATATCATTCG CCCCATATGG CGATTACTGG AGACAAATGC
421 GTAAAATATT AACACAAGAA CTCTTGAGTA ACAAGATGCT CAAGTCATTT AGCACAATCC
481 GAAAGGATGA GCTCTCGAAG CTCCTCTCGT CGATTTCGTT AGCAACAGCT TCTTCTGCAG
541 TGAACATAAA CGAAAAGCTT CTCTGGTTTA CAAGTTCAT GACTTGTAGA TTAGCCTTTG
601 GAAAAATATG CAACGATCGT GATGAATTGA TTATGTTAAT AAGGGAGATA TTAGCATTAT
661 CAGGAGGATT TGATGTGTGT GATTGTGTTCC CTTTCATGGAA ATTACTTCAC AATATGAGCA
721 ACATGAAAGC TAGATTGACG AATGTTCAAC ATAAGTATAA TCTAATTATG GAGAATATCA
781 TCAATGAGCA CAAAGAGAAT CATGCAGCAG GGATAAAGGG AAATAACGAG TTTGGTGGCG
841 AAGATATGAT TGATGCTTTA CTGAGGGTTA AGGAGAATAA TGAGCTTCAA TTTCTTATCG
901 AAAATGACAA CATGAAAGCA GTAATCTGCG ACTTGTTTAT TGCTGGAAC TAACTTCAT
961 ATACTGCAAT TATATGGGCA CTATCAGAAT TGATGAAGCA CCCAAGTGTT ATGGCCAAGG
1021 CACAAGCTGA AGTGAGAAAA GTCTTCAAAG AAAATGAAAA CTTGGACGAA AATGATCTTG
1081 ACAAGTTGCC ATACTTAAAA TCAGTGATCA AAGAAACACT AAGGATGCAT CCTCCAGTTC
1141 CTTTATTAGG ACCTAGAGAA TGCAGAGAAC AAAGTGAGAT TGATGGATAT ACTGTACCTC
1201 TTAAAGCTAG AGTAATGGTT AATGCATGGG CAATTGGAAG AGATCCTGAA AGTTGGGAAG
1261 ATCCTGAAAG TTTCAAACCC GAGCGATTG AAAATATTTT TGTTGATCTT ACGGGAAATC
1321 ACTATCAGTT CATCCCTTTC GGTTCAGGAA GAAGAATGTG TCCAGGAATG TCGTTTGTTT
1381 TAGTTAACAC TGGGCATCCT TTAGCTCAGT TGCTCTATTT CTTTGACTGG AAATTCCCTC
1441 ATAAGGTAA TGCAGCTGAT TTTCACACTA CTGAAACAAG TAGAGTTTTT GCAGCAAGCA
1501 AAGATGACCT CTACTTGATT CCAACAAATC ACATGGAGCA AGAGTAGCTC TAAATTGAAT
1561 TCTTGTCTTG GAACAATAAA AGAAGAACT CCAGCTTGGT CTACATTATT TCTTTTGTCT
1621 TTATATTAGT ATGGGTGTGT TCAGTTTCTT ATTTTAAAGG GTACCCTGAA AGATAAAGGG
1681 CTATATAAAC CAGTGAGACT TTTTATTGGT TGCAAGGTTT TAGATCAAGC CATAAGACAG
1741 CATATTTTAT TCAAAAAAAA AAAAAA

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SEQ. ID. NO. 204

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1 MDIQSSPFNL IALLLFISFL FILLKKWNTK IPKLPPGPWR LPLIGSLHHL KGKLPHHHLR
61 DLARKYGPLM YLQLGEVPV VISSPRIAKA VLKTHDLAFA TRPRFMSSDI VFYKSRDISF
121 APYGDYWRQM RKILTQELLS NKMLKSFSTI RKDELSKLLS SIRLATASSA VNINEKLLWF
181 TSCMTCRLAF GKICNDRDEL IMLIREILAL SGGFDVCDLP PSWKLHNMS NMKARLTNVH
241 HKYNLIMENI INEHKENHAA GIKGNNEFGG EDMIDALLRV KENNELQFPI ENDNMKAVIL
301 DLFIAGTETS YTAIIWALSE LMKHPSVMAK AQAEVRKVFK ENENLDENDL DKLPYLKSVI
361 KETLRMHPPV PLLGPRECRE QTEIDGYTVP LKARVMVNAW AIGRPESWE DPESFKPERF
421 ENISVDLTGN HYQFIPFGSG RRMCPGMSFG LVNTGHPLAQ LLYFFDWKFP HKVNAADFHT
481 TETSRVFAAS KDDLILPTN HMEQE

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NAME D207-AB4  
ORGANISM NICOTIANA TABACUM  
SEQ. ID. NO. 205

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1 AACCAACCTT CCTTTTCTTA CTTAGTAAAA TGGATATTCA GTCTTCTCCT TTCAACTTAA
61 TTGCTTTGCT ACTCTTCATT TCATTTCTTT TTATCCTATT GAAAAAGTGG AATACCAAAA
121 TCCCAAAGTT ACCTCCAGGT CCATGGAGAC TTCCCCTTAT TGGCAGCCTC CATCACTTGA
181 AAGGTAAACT CCCACACCAT CATCTTAGAG ATTTAGCCCG AAAATATGGA CCTCTCATGT
241 ATTTACAAC TGGAGAAGTT CCTGTAGTTG TAATATCTTC GCCACGTATA GCAAAAGCTG
301 TACTAAAAAC TCATGATCTT GCTTTTGCAA CGAGGCCTCG GTTCATGTCC TCGGACATTG
361 TGTTTTACAA AAGCAGGGAC ATATCATTCG CCCCATATGG CGATTACTGG AGACAAATGC
421 GTAAAATATT AACACAAGAA CTCTTGAGTA ACAAGATGCT CAAGTCATTT AGCACAATCC
481 GAAAGGATGG GCTCTCGAAG CTCCTCTCGT CGATTCGTTT AGCAACAGCT TCTTCTGCAG
541 TGAACATAAA CGAAAAGCTT CTCTGGTTTA CAAGTTGCAT GACTTGTTAG TTAGCCTTTG
601 GAAAAATATG CAACGATCGT GATGAATTGA TTATGTTAAT AAGGGAGATA TTAGCATTAT
661 CAGGAGGATT TGATGTGTGT GATTTGTTCC CTTCATGGAA ATTACTTCAC AATATGAGCA
721 ACATGAAAGC TAGATTGACG AATGTTCCAC ATAAGTATAA TCTAATTATG GAGAATATCA
781 TCAATGAGCA CAAAGAGAAT CATGCAGCAG GGATAAAGGG AAATAACGAG TTTGGTGGCG
841 AAGATATGAT TGATGCTTTA CTGAGGGTTA AGGAGAATAA TGAGCTTCAA TTTCTATCG
901 AAAATGACAA CATGAAAGCA GTAATCTGG ACTTGTTTAT TGCTGGAAC TAAACTTCAT
961 ATACTGCAAT TATATGGGCA CTATCAGAAT TGATGAAGCA CCCAAGTGTT ATGGCCAAGG
1021 CACAAGCTGA AGTGAGAAAA GTCTTCAAA AAAATGAAAA CTTGGACGAA AATGATCTTG
1081 ACAAGTTGCC ATACTTAAAA TCAGTGATCA AAGAAAACACT AAGGATGCAT CCTCCAGTTC
1141 CTTTATTAGG ACCTAGAGAA TGCAGAGAAC AAAGTGAGAT TGATGGATAT ACTGTACCTC
1201 TTAAAGCTAG AGTAATGGTT AATGCATGGG CAATTGGAAG AGATCCTGAA AGTTGGGAAG
1261 ATCCTGAAAG TTTCAAACCC GAGCGATTTG AAAATATTTT TGTTGATCTT ACGGGAAATC
1321 ACTATCAGTT CATTCTTTTC GGTTCAAGAA GAAGAATGTG TCCAGGAATG TCGTTTGGTT
1381 TAGTTAACAC TGGGCATCCT TTAGCTCAGT TGCTCTATTT CTTTGACTGG AAATTCCTC
1441 ATAAGGTTAA TGCAGCTGAT TTTCACACTA CTGAAACAAG TAGAGTTTTT GCAGCAAGCA
1501 AAGATGACCT CTACTTGATT CCAACAAATC ACATGGAGCA AGAGTAGCTC TAAATTGAAT
1561 TCTTGTCTTG GAACGATAAA AGAAGAAACT CCAGCTTGGT CTACATTATT TCTTTTGTCT
1621 TTATATTAGT ATGGGTGTGT TCAGTTTCTT GTTTTTAAGG GTACCCTGAA AGATAAAGGG
1681 CTATATAAAC CAGTGAGACT TTTTATTGAA AAAAAAAAAA AAAAAAAAAA AAAAAA

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SEQ. ID. NO. 206

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1 MDIQSSPFNL IALLLFISFL FILLKKWNTK IPKLPPGPWR LPLIGSLHHL KGKLPHHHLR
61 DLARKYGPLM YLQLGEVPVV VISSPRIAKA VLKTHDLAFA TRPRFMSSDI VFYKSRDISF
121 APYGDYWRQM RKILTQELLS NKMLKSFSSTI RKDELSKLLS SIRLATASSA VNINEKLLWF
181 TSCMTCRLAF GKICNDRDEL IMLIREILAL SGGFDVCDLF PSWKLLHNMS NMKARLTNVH
241 HKYNLIMENI INEHKENHAA GIKGNNEFGG EDMIDALLRV KENNELQFPI ENDNMKAVIL
301 DLFIAGTETS YTAIIWALSE LMKHPSVMAK AQAQEVKRVFK ENENLDENDL DKLPYLKSVI
361 KETLRMHPPV PLLGPRECRE QTEIDGYTVP LKARVMVNAW AIGRDPESWE DPESFKPERF
421 ENISVDLTGN HYQFIPFGSG RRMCPGMSFG LVNTGHPLAQ LLYLFDWKFP HKVNAADFHT
481 TETSRVFAAS KDDLILIPTN HMEQE

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NAME D207-AC4  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 207

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1 AACCAACCTT CCTTTTCTTA CTTAGTAAAA TGGATATTCA GTCTTCTCCT TTCAACTTAA
61 TTGCTTTGCT ACTCTTCATT TCATTTCTTT TTATCCTATT GAAAAAGTGG AATACCAAAA
121 TCCCAAAGTT ACCTCCAGGT CCATGGAGAC TTCCCCTTAT TGGCAGCCTC CATCACTTGA
181 AAGGTAAACT CCCACACCAT CATCTTAGAG ATTTAGCCCG AAAATATGGA CCTCTCATGT
241 ATTTACAAC TGGAGAAAGT CCTGTAGTTG TAATATCTTC GCCACGTATA GCAAAAGCTG
301 TACTAAAAAC TCATGATCTT GCTTTTGCAG CGAGGCCTCG GTTCATGTCC TCGGACATTG
361 TGTTTTACAA AAGCAGGGAC ATATCATTCG CCCCATATGG CGATTACTGG AGACAAATGC
421 GTAAATATTT AACACAAGAA CTCTTGAGTA ACAAGATGCT CAAGTCATTT AGCACAATCC
481 GAAAGGATGA GCTCTCGAAG CTCCTCTCGT CGATTTCGTT AGCAACAGCT TCTTCTGCAG
541 TGAACATAAA CGAAAAGCTT CTCTGGTTTA CAAGTTGCAT GACTTGTAGA TTAGCCTTTG
601 GAAAAATATG CAACGATCGT GATGAATTGA TTATGTTAAT AAGGGAGATA TTAGCATTAT
661 CAGGAGGATT TGATGTGTGT GATTTGTTC CTTCATGGAA ATTACTTCAC AATATGAGCA
721 ACATGAAAGC TAGATTGACG AATGTTACCC ATAAGTATAA TCTAATTATG GAGAATATCA
781 TCAATGAGCA CAAAGAGAAT CATGCAGCAG GGATAAAGGG AAATAACGAG TTTGGTGGCG
841 AAGATATGAT TGATGCTTTA CTGAGGGTTA AGGAGAATAA TGAGCTTCAA TTTCTTATCG
901 AAAATGACAA CATGAAAGCA GTAATTCTGG ACTTGTTTAT TGCTGGAAC TAAACTTCAT
961 ATACTGCAAT TATATGGGCA CTATCAGAAT TGATGAAGCA CCCAAGTGTT ATGGCCAAGG
1021 CACAAGCTGA AGTGAGAAAA GTCTTCAAAG AAAATGAAAA CTGGACGAA AATGATCTTG
1081 ACAAGTGCC ATACTTAAAA TCAGTGATCA AAGAAACACT AAGGATGCAT CCTCCAGTTC
1141 CTTTATTAGG ACCTAGAGAA TGCAGAGAAC AAAGTGAGAT TGATGGATAT ACTGTACCTC
1201 TTAAAGCTAG AGTAATGGTT AATGCATGGG CAATTGGAAG AGATCCTGAA AGTTGGGAAG
1261 ATCCTGAAAG TTTCAAACCC GAGCGATTTG AAAATATTTT TGTTGATCTT ACGGGAAATC
1321 ACTATCAGTT CATTCCTTTC GGTTCAGGAA GAAGAATGTG TCCAGGAATG TCGTTTGGTT
1381 TAGTTAACAC TGGGCATCCT TTAGCTCAGT TGCTCTATCT CTTTGACTGG AAATTCCCTC
1441 ATAAGGTAA TGCAGCTGAT TTTCACACTA CTGAAACAAG TAGAGTTTTT GCAGCAAGCA
1501 AAGATGACCT CTACTTGATT CCAACAAATC ACATGGAGCA AGAGTAGCTC TAAATTGAAT
1561 TCTTGTCTTG GAACAATAAA AGAAGAAACT CCAGCTTGGT CTACATTATT TCCTTTTGCT
1621 TTATATTAGT ATGGGTGTGT TCAGTCTCTT GTTTTAAAGG GTACCCTGAA AGATAAAGGG
1681 CTATATAAAC CAGTGAGACT TTTTATTGGT TGCAAGGTTT TAGATCAAGC CATAAGACAG
1741 CATATTTTAT TCCACCATT TCTATCATGT TTAATAAAGT TCCTTTCGTT TATTGTTAGA
1801 AAAAAAAAAA AAAAAAAAAA AAA

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SEQ. ID. NO. 208

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1 MDIQSSPFNL IALLLFISFL FILLKKWNTK IPKLPPGPWR LPLIGSLHHL KGKLPHHHLR
61 DLARKYGPLM YLQLGEVPV VISSPRIAKA VLKTHDLAFA TRPRFMSSDI VFYKSRDISF
121 APYGDYWRQM RKILTQELLS NKMLKSFSSTI RKDELSKLLS SIRLATASSA VNINEKLLWF
181 TSCMTCRLAF GKICNDRDEL IMLIREILAL SGGFDVCDLF PSWKLLHNMS NMKARLTNVH
241 HKYNLIMENI INEHKENHAA GIKGNNEFGG EDMIDALLRV KENNELQFPI ENDNMKAVIL
301 DLFIAGTETS YTAIIWALSE LMKHPSVMAK AQAEVRKVFK ENENLDENDL DKLPYLKSVI
361 KETLRMHPPV PLLGPRECRE QTEIDGYTVP LKARVMVNAW AIGRDPESWE DPESFKPERF
421 ENISVDLTGN HYQFIPFGSG RRMCPGMSFG LVNTGHPLAQ LLYLFDWKFP HKVNAADFHT
481 TETSRVFAAS KDDLILYIPTN HMEQE

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NAME D209-AA10  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 209

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1 ATATGCAACT GAGATTTGAA GAATACCAAC TAACCAAAAT GCAGTTCCTC AGCCTGGTTT
61 CCATTTTCCT ATTTCTATCT TTCCTCTTTT TGTAAAGGGT ATGGAAGAAC TCCAATAGCC
121 AAAGCAAAAA GTTGCCACCA GGTCCATGGA AACTACCAAT ACTAGGAAGT ATGCTTCATA
181 TGGTTGGTGG ACTACCACAC CATGTCCTTA GAGATTTAGC CAAAAAATAT GGACCACTTA
241 TGCACCTTCA ATTAGGTGAA GTTTCTGCGG TTGTGGTTAC TTCTCCTGAT ACGGCAAAAG
301 AAGTATTAAA AACTCATGAC ATCGCTTTTG CGTCTAGGCC TAGCCTTTTG GCCCCGGAGA
361 TTGTCTGTTA CAATAGGTCT GATCTAGCCT TTTGCCCTTA TGGCGACTAT TGGAGACAAA
421 TGCGTAAAT ATGTGTCTTG GAAGTGCTCA GTGCCAAGAA TGTTCGGACA TTTAGCTCTA
481 TTAGGCGGAA TGAAGTTCTT CGTCTCATT ATTTTATCCG GTCATCTTCT GGTGAACCTA
541 TTAATGTTAC GGAAAGGATC TTTTGTGTTCA CAAGCTCCAT GACATGTAGA TCAGCGTTTG
601 GGCAAGTGTT CAAAGAGCAA GACAAATTTA TACAATAAT TAAAGAAGTG ATACTCTTAG
661 CAGGAGGGTT TGATGTGGCT GACATATTC CTTCACTGAA GTTCTTTCAT GTGCTCAGTG
721 GAATGAAGGG TAAAGATTATG AATGCACACC ATAAGGTAGA TGCCATTGTT GAGAATGTCA
781 TCAATGAGCA CAAGAAAAAT CTTGCAATTG GGAAAACTAA TGGAGCGTTA GGAGGTGAAG
841 ATTTAATTGA TGTTCTTCTA AGACTTATGA ATGATGGAGG CCTTCAATTT CCTATCACCA
901 ACGACAACAT CAAAGCTATA ATTTTGTGACA TGTTTGCTGC CGGGACAGAG ACTTCATCGT
961 CAACAATTGT GTGGGCTATG GTAGAAATGG TGAAAAATCC AGCCGTATTC GCGAAAGCTC
1021 AAGCAGAAGT AAGAGAAGCA TTTAGAGGAA AAGAAACTTT CGATGAAAAT GATGTGGAGG
1081 AGCTAAACTA CCTAAAGTTA GTAATAAAAG AAACCTCTAAG ACTTCATCCA CCGGTTCCAC
1141 TTTTGCTCCC AAGAGAATGT AGGGAAGAGA CAAATATAAA CGGCTACACT ATTCTGTAA
1201 AGACCAAAGT CATGGTTAAT GTTTGGGCTT TGGGAAGAGA TCCAAAATAT TGGAATGACG
1261 CAGAACTTT TATGCCAGAG AGATTTGAGC AGTGCTCTAA GGATTTTGTT GGTAATAATT
1321 TTGAATATCT TCCATTTGGT GCGGAAGGA GGATTTGTCC TGGGATTTCT TTTGGCTTAG
1381 CTAATGCTTA TTTGCCATTG GCTCAATTAC TATATCACTT CGATTGGAAA CTCCCTGCTG
1441 GAATCGAACC AAGCGACTTG GACTTGACTG AGTTGGTTGG AGTAACTGCC GCTAGAAAAA
1501 GTGACCTTTA CTTGGTTGCG ACTCCTTATC AACCTCCTCA AAAGTGATTT AATGGTTTCA
1561 AGTTTTTATT TCCTAGCAAA CCCCCTATT GTCCTATCTT TCTTTTGGTG TTTTCGGTTT
1621 TATCTACTCT AATACATGCA TCTTTTACCA TATAGGAATG TACCATGTTG TCG

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SEQ. ID. NO. 210

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1 MQLRFEEYQL TKMQFFSLVS IFLFLSFLFL LRVWKNNSNSQ SKKLPPGPWK LPILGSMLHM
61 VGGLPHHVLR DLAKKYGPLM HLQLGEVSAV VVTSPDTAKE VLKTHDIAFA SRPSLLAPEI
121 VCYNRSDLAF CPYGDYWRQM RKICVLEVLS AKNVRTFSSI RRNEVLRLIN FIRSSSGEPI
181 NVTERIFLFT SSMTCRSAFG QVFKEQDKFI QLIKEVILLA GGFVDADIFP SLKFLHVLGS
241 MKGKIMNAHH KVDAIVENV I NEHKKNLAIK KTNGALGGED LIDVLLRLMN DGGLOFPITN
301 DNIKAIIFDM FAAGTETSSS TIVWAMVEMV KNPVAFKAQ AEVREAFRGK ETFDENDVEE
361 LNYLKLVIKE TLRLHPPVPL LLPRECREET NINGYTIPVK TKVMVNVWAL GRDPKYWNDA
421 ETFMFERFEQ CSKDFVGNNF EYLPFGGRR ICPGISFGLA NAYLPLAQLL YHFDWKLPAQ
481 IEPSDLDLTE LVGVTAARKS DLYLVATPYQ PPQK

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NAME D209-AA12  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 211

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1 ATATGCAACT GAGATTTGAA GAATACCAAC TAACCAAAT GCAGTTCTTC AGCTTGGTTT
61 CCATTTTCCT ATTTCTATCT TTCCTCTTTT TGTAAAGGAT ATGGAAGAAC TCCAATAGCC
121 AAAGCAAAAA GTTGCCACCA GGTCCATGGA AACTACCAAT ACTAGGAAGT ATGCTTCATA
181 TGGTTGGTGG ACTACCACAC CATGTCCTTA GAGATTTAGC CAAAAAATAT GGACCACTTA
241 TGCACCTTCA ATTAGGTGAA GTTCTGCGG TTGTGGTTAC TTCTCCTGAT ACGGCAAAAG
301 AAGTATTAAT AACTCATGAC ATCGCTTTTG CGTCTAGGCC TAGCCTTTTG GCCCCGAGA
361 TTGTCTGTTA CAATAGGTCT GATCTAGCCT TTTGCCCCTA TGGCGACTAT TGGAGACAAA
421 TGCGTAAAAT ATGTGTCTTG GAAGTGCTCA GTGCCAAGAA TGTTCGGACA TTTAGCTCTA
481 TTAGGCGGAA TGAAGTTCTT CGTCTCATT ATTTTATCCG GTCATCTTCT GGTGAACCTA
541 TTAATGTTAC GGAAAGGATC TTTTGTTC AAGCTCCAT GACATGTAGA TCAGCGTTTG
601 GGCAAGTGTT CAAAGAGCAA GACAAATTTA TACAACATA TAAAGAAATG ATACTCTTAG
661 CAGGAGGGTT TGATGTGGCT GACATATTCC CTTCACTGAA GTTTCTTCAT GTGCTCAGTG
721 GAATGAAGGG TAAGATTATG AATGCACACC ATAAGGTAGA TGCCATTGTT GAGAATGTCA
781 TCAATGAGCA CAAGAAAAAT CTGCAATTG GGAAGACTAA TGGAGCGTTA GGAGGTGAAG
841 ATTTAATTGA TGTTCTTCTA AGACTTATGA ATGATGGAGG CCTTCAATTT CCTATCACC
901 ACGACAACAT CAAAGCCATA ATTTTGTACA TGTTTGCTGC CGGGACAGAG ACTTCATCGT
961 CAACAATTGT GTGGGCTATG GTAGAAATGG TGAAAAATCC AGCCGTATTC GCGAAAGCTC
1021 AAGCAGAAGT AAGAGAAGCA TTTAGAGGAA AAGAACTTT CGATGAAAAAT GATGTGGAGG
1081 AGCTAAACTA CCTAAAGTTA GTAATAAAG AAACCTAAG ACTTCATCCA CCGGTTCCAC
1141 TTTTGCTCCC AAGAGAATGT AGGGAAGAGA CAAATATAAA CGGCTACACT ATTCCTGTAA
1201 AGACCAAAGT CATGGTTAAT GTTTGGGCTT TGGGAAGAGA TCCAAAATAT TGGAAATGACG
1261 CAGAACTTT TATGCCAGAG AGATTTGAGC AGTGCTCTAA GGATTTTGTT GGTAATAATT
1321 TTGAATATCT TCCATTTGGT GCGGGAAGGA GGATTTGTCC TGGGATTCG TTTGGCTTAG
1381 CTAATGCTTA TTTGCCATTG GCTCAATTAC TATATCACTT CGATTGGAAA CTCCCTGCTG
1441 GAATCGAACC AAGCGACTTG GACTTGACTG AGTTGGTTGG AGTAACTGCC GCTAGAAAAA
1501 GTGACCTTTA CTTGGTTGCG ACTCCTTATC AACCTCCTCA AAAGTGATTT AATGGTTTCA
1561 AGTTTTTATT TCCTAGCAAA CCCCCTATT GTCTATCTT TCTTTTGGTG TTTTCGGTTT
1621 TATCTACTCT AATACATGCA TCTTTTACCA TATAGGAATG TACCATGTTG TCG

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SEQ. ID. NO. 212

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1 MQLRFEEYQL TKMQFFSLVS IFLFLSFLFL LRIWKNSNSQ SKKLPPGPWK LPILGSM LHM
61 VGGLPHHVLRL DLAKKYGPLM HLQLGEVSAV VVTSPDTAKE VLKTHDIAFA SRPSLLAPEI
121 VCYNRSDLAF CPYGDYWRQM RKICVLEVLS AKNVRTFSSI RRNEVRLRLIN FIRSSSGEPI
181 NVTERIFLFT SSMTCRSAFG QVFKEQDKFI QLIKEVILLA GGFVDVADIFP SLKFLHVLSG
241 MKGKIMNAHH KVDAIVENVI NEHKKNLAIG KTINGALGGED LIDVLLRLMN DGGLOFPITN
301 DNIAKIIIFDM FAAGTETSSS TIVWAMVEMV KNPVAFKAQ AEVREAFRGK ETFDENDVEE
361 LNYLKLVIKE TLRLHPPVPL LLPRECREET NINGYTI PVK TKVMVNVWAL GRDPKYW NDA
421 ETFMPEFEQ CSKDFVGNMF EYLPFGGGRR ICPGISFGLA NAYLPLAQLL YHFDWKLPAG
481 IEPSDLDLTE LVGVTAARKS DLYLVATPYQ PPQK

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NAME D209-AH10  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 213

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1 ATATGCAACT GAGATTTGAA GAATACCAAC TAACCAAAGT GCAGTTCTTC AGCTTGGTTT
61 CCATTTTCCT ATTTCTATCT TTCCTCTTTT TGTAAAGGAT ATGGAAGAAC TCCAATAGCC
121 AAAGCAAAAA GTTGCCACCA GGTCCATGGA AACTACCAAT ACTAGGAAGT ATGCTTCATA
181 TGGTTGGTGG ACTACCACAC CATGTCCTTA GAGATTTAGC CAAAAAATAT GGACCACTTA
241 TGCACCTTCA ATTAGGTGAA GTTTCTGCGG TTGTGGTTAC TTCTCCTGAT ACGGCAAAAAG
301 AAGTATTAAA AACTCATGAC ATCGCTTTTG CGTCTAGGCC TAGCCTTTTG GCCCGGAGA
361 TTGTCGTGTA CAATAGGTCT GATCTAGCCT TTTGCCCTA TGGCGACTAT TGGAGACAAA
421 TGCCTAAAAT ATGTGTCTTG GAAGTGCTCA GTGCCAAGAA TGTTCGGACA TTTAGCTCTA
481 TTAGGCGGAA TGAAGTTCTT CGTCTCATT ATTTTATCCG GTCATCTTCT GGTGAACCTA
541 TTAATGTTAC GGAAGGATC TTTTGTTC CAAGCTCCAT GACATGTAGA TCAGCGTTTG
601 GGCAAGTGTT CAAAGAGCAA GACAAATTTA TACAATAAT TAAAGAAGTG ATACTCTTAG
661 CAGGAGGTT TGATGTGGCT GACATATTCC CTTCACTGAA GTTCTTCAT GTGCTCAGTG
721 GAATGAAGGG TAAGATTATG AATGCACACC ATAAGGTAGA TGCCATTGTT GAGAATGTCA
781 TCAATGAGCA CAAGAAAAAT CTTGCAATTG GAAAACTAA TGGAGCGTTA GGAGGTGAAG
841 ATTTAATTGA TGTTCTCTA AGACTTATGA ATGATGGAGG CTTCAATTT CCTATCACC
901 ACGACAACAT CAAAGCTATA ATTTTGTACA TGTTTGCTGC CGGGACGGAG ACTTCATCGT
961 CAACAATTGT GTGGGCTATG GTAGAAATGG TGAAAAATCC AGCCGTATTC GCGAAAGCTC
1021 AAGCAGAAGT AAGAGAAGCA TTTAGAGGAA AAGAACTTT CGATGAAAT GATGTGGAGG
1081 AGCTAAACTA CCTAAAGTTA GTAATAAAAG AAACCTAAG ACTTCATCCA CCGGTTCCAC
1141 TTTTGTCTCC AAGAGAATGT AGGGAAGAGA CAAATATAAA CGGCTACACT ATTCCTGTAA
1201 AGACCAAAGT CATGGTTAAT GTTTGGGCTT TGGGAAGAGA TCCAAAATAT TGAATGACG
1261 CAGAACTTT TATGCCAGAG AGATTTGAGC AGTGCTCTAA GGATTTTGT GGTAAATAAT
1321 TTGAATATCT TCCATTTGGT GCGGAAGGA GGATTTGTCC TGGGATTTG TTTGGCTTAG
1381 CTAATGCTTA TTTGCCATTG GCTCAATTAC TATATCACTT CGATTGGAAA CTCCCTGCTG
1441 GAATCGAACC AAGCGACTTG GACTTGACTG AGTTGGTTGG AGTAACTGCC GCTAGAAAAA
1501 GTGACCTTTA CTTGGTTGCG ACTCCTTATC AACCTCCTCA AAAGTGATTT AATGGTTTCA
1561 AGTTTTTATT TCCTAGCAAA CCCCCTATT GTCTATCTT TCTTTTGGTG TTTTCGGTTT
1621 TATCTACTCT AATACATGCA TCTTTTACCA TATAGGAATG TACCATGTTG TCG

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SEQ. ID. NO. 214

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1 MQLRFEEYQL TKVQFFSLVS IFLFLSFLFL LRIWKNSNSQ SKKLPPGPWK LPILGSM LHM
61 VGGLPHVLR DLAKKYGPLM HLQLGEVSAV VVTSPDTAKE VLKTHDIAFA SRPSLLAPEI
121 VCYNRDLAF CPYGDYWRQM RKICVLEVL AKNVRTFSSI RRNEVLRLIN FIRSSSGEPI
181 NVTERIFLFT SSMTCRSAFG QVFKEQDKFI QLIKEVILLA GGFDVADIFP SLKFLHVLG
241 MKGKIMNAHH KVDAIVENVI NEHKKNLAIK KTNALGGED LIDVPLRLMN DGGLQFPITN
301 DNIKAIIFDM FAAGTETSSS TIVWAMVEMV KNPAVFAKAQ AEVREAFRGK ETFDENDVEE
361 LNYLKLVIKE TLR LHPPVPL LLPRECREET NINGYTIPVK TKVMVNVWAL GRDPKYW NDA
421 ETFMPPERFEQ CSKDFVGNNF EYLPFGGRR ICPGISFGLA NAYLPLAQLL YHFDWKLPAG
481 IEPSDLDLTE LVGVTAARKS DLYLVATPYQ PPQK

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NAME D87A-AF3  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 215

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1 GAAATGGGAA ATGCTCACAA CAGCAAAATT GCAGCAATCT GTTTGATAAT TTTCTTGGTA
61 TATAAAGCAT GGAATTGTT GAAGTGGATA TGGATTAAGC CAAAGAAACT GGAGAGTTGC
121 CTCAGAAAAAC AGGGACTCAA AGGAAATTCC TACAGGCTAT TCTATGGAGA TATGAAAGAA
181 TTGTCCAAAA GTCTCAAGGA AATCAATTCA AAGCCCATCA TCAATCTATC AAATGAAGTA
241 GCCCCAAGAA TCATTCCTTA TTATCTTGAA ATCATCCAAA AATATGGTAA AAGATGTTTT
301 GTTTGGCAAG GACCAACCCC CGCAATATTA ATAACAGAGC CAGAATTAAT AAAGGAGATA
361 TTTGGTAAGA ACTATGTTTT TCAGAAGCCT AATAATCCCA ACCCACTGAC CAAGTTATTG
421 GCTCGAGGTG TTGTAAGCTA CGAGGAAGAA AAATGGGCAA AACACAGAAA GATCTTAAAC
481 CCTGCCTTTC ATATGGAGAA GTTGAAGCAT ATGCTACCAG CATTTTACTT GAGCTGTAGT
541 GAGATGCTGA ACAAATGGGA GGAGATTATC CCAGTAAAAG AATCAAATGA GTTGGACATT
601 TGGCCTCATC TTCAAAGAAT GACAAGTGAT GTGATTTCTC GTGCTGCCCT TGGTAGTAGC
661 TACGAAGAAG GAAGAAGAAT ATTTGAACCT CAAGAAGAAC AAGCTGAGTA TCTAACGAAG
721 ACATTCAATT CAGTTTATAT CCCAGGTTCC AGATTTTTTC CCAATAAAAT GAACAAAAGA
781 ATGAAAGAAT GTGAAAAGGA AGTACGAGAA ACAATTACGT GTCTAATTGA CAACAGATTA
841 AAGGCAAAAG AAGAAGGCAA TGGCAAGGCC CTCAATGATG ACCTACTGGG TATATTATTA
901 GAGTCAAATT CTATAGAAAT TGAAGAACAT GGTAACAAGA AGTTTGAAT GAGTATACCT
961 GAAGTAATTG AAGAGTGCAA ATTATTCTAT TTTGCTGGCC AAGAGACTAC ATCAGTATTG
1021 CTTGTGTGGA CACTGATTTT GTTAGGGAGA AATCCAGAAT GGCAGGAACG TGCTAGAGAG
1081 GAAGTTTTTC AAGCCTTTGG AAGTGATAAA CCAACTTTTG ACGAATTATA TCGCTTGAAA
1141 ATTGTGACGA TGATTTTGTA CGAGTCTTTA AGGTTATATC CACCAATAGC AACTCGTACT
1201 CGAAGGACTA ATGAAGAAAC AAAATTAGGG GAAGTAGATT TACCAAAGGG TGCCTGCTC
1261 TTTATACCAA CAATCTTATT ACATCTTGAC AAGGAAATTT GGGGTGAAGA TGCAGATGAG
1321 TTCAATCCGG AGAGATTTAG CGAAGGGGTG GCAAAGGCAA CAAAGGGGAA AATGACATAT
1381 TTTCCATTTG GTGCAGGACC GCGAAAATGC ATTGGGCAA ACTTCGCGAT TTTGGAAGCA
1441 AAAATGGCTA TAGCTATGAT TCTACAACGC TTCTCCTTCG AGCTCTCTCC ATCTTATACA
1501 CACTCTCCAT ACACTGTGGT CACTTTGAAA CCCAAATATG GTGCTCCCCT AATAATGCAC
1561 AGGCTGTAGT CCTGTGAGAA

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SEQ. ID. NO. 216

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1 MGNHNSKIA AICLIIFLVY KAWELLKWIW IKPKKLESCL RKQGLKGSY RLFYGDMKEL
61 SKSLKEINSK PIINLSNEVA PRIIPYYLEI IQKYGKRCFV WQGPTPAILI TEPELIKEIF
121 GKNYVFQKPN NPNPLTKLLA RGVVSYEBEK WAKHRKILNP AFHMEKLKHM LPAFYLSLSE
181 MLNKWEEIIP VKESNELDIW PHLQRMSTDV ISRAAFGSSY EGRRI FELQ EEQAEYLTKT
241 FNSVIIPGSR FFPNKMNMKRM KECEKEVRET ITCLIDNRLK AKEEGNGKAL NDDLGLILLE
301 SNSIEIEEHG NKKFGMSIPE VIEECKLFYF AGQETTSVLL VWTLLILLGRN PEWQERAREE
361 VFQAFGSDKP TFDLYRLKI VTMIYESLR LYPPIATRTR RTNEETKLGE LDLPKGALLF
421 IPTILLHLDK EIWGEDADEF NPERFSEGVA KATKGKMTYF PFGAGPRKCI GQNFALILEAK
481 MAIAMILQRF SFELSPSYTH SPYTVVTLKP KYGAPLIMHR L

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NAME D208-AC8  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 217

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1 ATGCTTTCTC CCATAGAAGC CTTTGTAGGA CTAGTAACCT TCACATTTCT CTTATACTTC
61 CTATGGACAA AAAAATCTCA AAAACTTCCA AAACCCTTAC CACCGAAAAAT CCCC GGAGGA
121 TGGCCGGTAA TCGGCCATCT TTTTCACTTC AATAACGACG GCGACGACCG TCCATTAGCT
181 CGAAAGCTCG GAGACTTAGC TGATAAATAC GGCCCCGTTT TCACTTTTCG GCTAGGTCTT
241 CCCCTTGTGC TAGTTGTAAG CAGTTACGAA GCTATAAAAG ATTGCTTCTC TACAAATGAT
301 GCCATTTTCT CCAATCGTCC AGCTCTTCTT TACGGCGAAT ACCTTGGCTA CAATAATACA
361 ATGCTTTTTT TAGCAAATTA CGGACCTTAC TGGCGAAAAA ATCGTAAATT AGTCATTTCAG
421 GAAGTTCTCT CTGCTAGTCG TCTCGAAAAA TTCAAACAAG TGAGATTCAC CAGAATTCAA
481 ACGAGCATT AAGAAATGAA TTTTGGTCTG ATCGTGAAAA TGATCGCTGG GAAAAATTAT
541 GATTGGTTAG AAGAAATGAA TTTTGGTCTG ATCGTGAAAA TGATCGCTGG GAAAAATTAT
601 GAATCCGGTA AAGGAGATGA ACAAGTGGAA AGATTTAAGA ATGCGTTTAA GGATTTTATG
661 GTTTTATCAA TGGAATTTGT ATTATGGGAT GCATTTCCAA TTCCATTATT TAAATGGGTG
721 GATTTTCAAG GTCATATTA GGCATGAAA AGGACATTTA AGGATATAGA TTCTGTTTTT
781 CAGAACTGGT TAGAGGAACA TATTAATAAA AGAGAAAAAA TAGAGGTTGG TGCAGAAGGG
841 AATGAACAAG ATTTCAATTGA TGTGGTGCCT TCAAAATTGA GTAAAGAATA TCTTGATGAA
901 GGTTACTCTC GTGATACTGT CATTAAAGCA ACAGTTTTTA GTTTGGTCTT GGATGCAGCA
961 GACACAGTTG CTCTTCACAT AAATGGGGGA ATGACATTAT TGATAAACAA TCAAAATGCC
1021 TTGATGAAAG CACAAGAAGA GATAGACACA AAAGTTGGTA AGGATAGATG GGTAGAAGAG
1081 AGTGATATTA AGGATTTAGT ATACCTCCAA GCTATTGTGA AAAAGGTGTT ACGATTATAT
1141 CCACCAGGAC CTTTGTTAGT ACCACATGAA AATGTAAAGG ATTGTGTTGT TAGTGGATAT
1201 CACATTCCTA AAGGGACTAG ATTATTGCGA AACGTCATGA AACTGCAGCG CGATCCTAAA
1261 CTCTTGTC AAATCCTGATAA GTTCGATCCA GAGAGATTCA TCGCTGGTGA TATTGACTTC
1321 CGTGGTCACT ACTATGAGTT TATCCCATTT GGTTCCTGGAA GACGATCTTG TCCGGGGATG
1381 ACTTATGCAT TGCAAGTGGA ACACCTAACA ATGGCACATT TAATCCAGGG TTTCAATTAC
1441 AAAACTCCAA ATGACGAGGC CTTGGATATG AAGGAAGGTG CAGGCATAAC AATACGTAAG
1501 GTAAATCCAG TGAATTGAT AATAACGCCT CGCTTGGCAC CTGAGCTTTA CTAAACCTA
1561 AGATGTTTCA TCTTGTTGA TCATTGT

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SEQ. ID. NO. 218

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1 MLSPIEAFVG LVTFTFLLYF LWTKKSQKLP KPLPPKIPGG WPVIGHLHFH NNDGDDRPLA
61 RKLGLDLADKY GPVFTFRLGL PLVLVSSYE AIKDCFSTND AIFSNRPALL YGEYLGYNNT
121 MLFLANYGPY WRKNRKLVIQ EVLSASRLEK FKQVRFTRIQ TSIKNLYTRI NGNSSTINLT
181 DWLEELNFGL IVKMIAGKNY ESGKGDEQVE RFKNFAKDFM VLSMEFVLWD AFPIPLFKWV
241 DFQGHKAMK RTFKDIDSFV QNWLEEHINK REKIEVGAEG NEQDFIDVVL SKLSKEYLDE
301 GYSRDTVIAK TVFSLVLDA DTVLHINWG MTLINNNQNA LMKAEQEEIDT KVGKDRWVEE
361 SDIKDLVYLQ AIVKKVLRLY PPGPLLPHE NVKDCVVSFY HIPKGTRLFA NVMKLQRDPK
421 LLSNPDKFDP ERFIAGDIDF RGHYEFIFP GSRRRSCPGM TYALQVEHLT MAHLIQGFNY
481 KTPNDEALDM KEGAGITIRK VNPVELIITP RLAPELY

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NAME D215-AB5  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 219

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1 GGGAGAAGGC CTTCAATATG GAGATACCAT ATTACAGCTT AAAAATTGCA ATTTCTTCAT
61 TTGCAATTAT CTTTGTACTA AGATGGGCAT GGAAAATCTT GAATTATGTG TGGTAAAAAC
121 CAAAAGAATT GGAGAAATAC CTCAGACAGC AGGGTTTCAA AGGAACTCTT TACAAATCTT
181 TGTTTGGGGA TATGAAAGAG ACGAAGAAAA TGGGTGAAGA AGCTATGTCT AAGCCAATCA
241 ATTTCTCTCA TGACATGATT TGGCCTAGAG TTATGCCATT CATCCACAAA ACCATCACCA
301 ATTATGGTAA GAATTGTATT GTGTGGTTTG GGCCAAGACC AGCAGTCCTG ATCAGAGACC
361 CGGAACCTGT AAAGGAGGTG CTAACGAAGA ATTTCTGTCTA TCAGAAGCCG CTTGGCAATC
421 CACTCACAAA GTTGGCAGCA ACTGGAATTG CAGGCTATGA AACAGATAAA TGGGCTACAC
481 ATAGAAGGCT TCTCAATCCT GCTTTTCACC TTGACAAGTT GAAGCATATG CTACCTGCAT
541 TCCAATTTAC TGCTAGTGAG ATGTTGAGCA AATTGGAGAA AGTTGTTTCA CCAAACGGAA
601 CAGAGATAGA TGTGTGGCCA TATTTACAAA CTTTGACAAG TGATGCCATT TCAAGAACTG
661 CGTTTGGAAG TAGTTATGAA GAAGGAAGAA AGATTTTGA CCTTCAAAAA GAACAACCTT
721 CACTAATTCT AGAAGTTTCA CGCACAAATAT ATATTCCAGG ATGGAGGTTT TTGCCAACGA
781 AAAGGAACAA AAGGATGAAG CAAATATTTA ATGAAGTACG AGCACTGGTA TTTGGAATTA
841 TTAAGAAAAG GATGAGTATG ATTGAAAATG GAGAAGCACC TGATGATTTA TTGGGAATAT
901 TATTGGCATC CAATTTAAAA GAAATCCAAC AACATGGAAA CAACAAGAAA TTTGGTATGA
961 GTATTGATGA GGTGATTGAA GAGTGTAAC TCTTCTATTT TGCTGGGCAA GAGACTACTT
1021 CATCTTTACT TGTATGGACT ATGATTTTGT TGTGCAAATA TCCTAATTGG CAAGATAAAG
1081 CTAGAGAAGA GGTTTTGCAA GTGTTTGGGA GTAGGGAAGT TGACTATGAC AAGTTGAATC
1141 AGCTAAAAAT AGTAACTATG ATCTTAAACG AGGTCTTAAG GTTGATCCA GCAGGATATG
1201 TGATTAATCG AATGGTAAAC AAAGAAACAA AGTTAGGGAA TTTGTGTTTA CCAGCCGGCG
1261 TACAGCTCGT GTTACCAACA ATGTTGTTGC AACATGATAC TGAAATATGG GGAGATGATG
1321 CAATGGAGTT CAATCCAGAG AGATTTAGTG ATGGAATATC CAAAGCAACA AAAGGAAAAC
1381 TTGTGTTTTT TCCATTTAGT TGGGGTCCAA GAATATGTAT TGGGCAAAAT TTTGCTATGT
1441 TAGAGGCTAA AATGGCAATG GCTATGATTC TGAAAACCTA TGCATTTGAA CTCTCTCCAT
1501 CTTATGCTCA TGCTCCTCAT CCACTACTAC TTCAACCTCA ATATGGTGCT CAATTAATTT
1561 TGTACAAGTT GTAGATATGG TCAATCTGGA ACTTGTTATG GAACCTTTAT CATCGTAATC
1621 AACCATATTG AGGG

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SEQ. ID. NO. 220

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1 MEIPYYSLKI AISSFAIIFV LRWAWKILNY VWLKPKELEK YLRQQGFKGN SYKFLFGDMK
61 ETKKMGEEM SKPINFSHDM IWPRVMPFIH KTITNYGKNC IVWFGPRPAV LITDPELVKE
121 VLTKNFVYQK PLGNPLTKLA ATGIAGYETD KWATHRRLLN PAFHLDKLBH MLPAFQFTAS
181 EMLSKLEKVV SPNGTEIDVW PYLQTLTSDA ISRTAFGSSY EEGRKIFDLQ KEQLSLILEV
241 SRTIYIPGWR FLPTKRNRKM KQIFNEVRAL VFGIIKRMS MIENGEAPDD LLGILLASNL
301 KEIQQHGNMK KFGMSIDEVI EECKLFYFAG QETTSSLLVW TMILLCKYPN WQDKAREEVL
361 QVFGSREVDY DKLNLQKIVT MILNEVLRLY PAGYVINRMV NKETKLGNLC LPAGVQLVLP
421 TMLLQHDTEI WGDDAMEFNP ERFSDGISA TKGKLVFFPF SWGPRICIGQ NFAMLEAKMA
481 MAMILKTYAF ELSPSYAHAP HPLLLQPQYG AQLILYKL

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NAME D103-AH3  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 221

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1 ATGGTTTTTC CCATAGAAGC CTTTGTAGGA CTAGTAACCT TCACATTTCT CTTATACTTC
61 CTATGGACAA AAAAATCTCA AAAACTTCCA AAACCCCTTAC CACCGAAAAT CCCC GGAGGA
121 TGGCCGGTAA TCGGCCACCT TTTTCACTTC AATAACGACG GCGACGACCG TCCATTAGCT
181 CGAAAACTCG GAGACTTAGC TGATAAATAC GGCCCCGTTT TCACTTTTCG GCTAGGTCTT
241 CCCCTTGTGC TAGTTGTAAG CAGTTACGAA GCTACAAAAG ATTGCTTCTC TACAAATGAC
301 GCCATTTTCT CCAATCGTCC AGCTTTTCTT TACGGCGAAT ACCTTGGCTA CAATAATACA
361 ATGCTTTTTT TAGCAAATTA CGGACCTTAC TGGCGAAAAA ATCGTAAATT AGTCATTCAG
421 GAAGTTCTCT CTGCTAGTCG TCTCGAAAAA TTCAAACAAG TGAGATTCAC CAGAATTCAA
481 ACGAGCATT AAGAAATTGAA TTTTGGTCTG ATCGTGAAAA TGATCGCTGG GAAAAATTAT
541 GATTGGTTAG AAGGAGATGA ACAAGTGGAA AGATTTAAGA ATGCGTTTAA GGATTTTATG
601 GAATCCGGTA AAGGAGATGA ACAAGTGGAA AGATTTAAGA ATGCGTTTAA GGATTTTATG
661 GTTTTATCAA TGGAATTTGT ATTATGGGAT GCATTTCCTA TTCCATTATT TAAATGGGTG
721 GATTTTCAAG GTCATATTAA GACAATGAAA AGGACATTTA AGGATATAGA TTCTGTTTTT
781 CAGAACTGGT TAGAGGAACA TATTAATAAA AGAGAAAAAA TGGAGGTTGG TGCAGAAGGG
841 AATGAACAAG ATTTTCATTGA TGTGGTGTCT TCAAAATTGA GTAAAGAATA TCTTGATGAA
901 GGTTACTCTC GTGATACTGT CATTAAAGCA ACAGTTTTTA GTTTGGTCTT GGATGCAGCA
961 GACACAGTTG CTCTTCACAT AAATTTGGGGA ATGACATTAT TGATAAACAA TCAAAATGCC
1021 TTGATGAAAG CACAAGAAGA GATAGACACA AAAGTTGGTA AGGATAGATG GGTAGAAGAG
1081 AGTGATATTA AGGATTTAGT ATACCTCCAA GCTATTGTTA AAAAGGTGTT ACGATTATAT
1141 CCACCAGGAC CTTTGTAGT ACCACATGAA AATGTAAAGG ATTGTGTTGT TAGTGGATAT
1201 CACATTCCTA AAGGGACTAG ATTATTCGCA AACGTCATGA AACTGCAGCG CGATCCTAAA
1261 CTCTTGTC AATCCTGATA GTTCGATCCA GAGAGATTCA TCGCTGGTGA TATTGACTTC
1321 CGTGGTCACC ACTATGAGTT TATCCCATCT GGTTCCTGGA GACGATCTTG TCCGGGGATG
1381 ACTTATGCAT TGCAAGTGGA ACACCTAACA ATGGCACATT TAATCCAGGG TTTCAATTAC
1441 AAAACTCCAA ATGACGAGGT CTTGGATATG AAGGAAGGTG CAGGCATAAC AATACGTAAG
1501 GTAAATCCAG TGGAATTGAT AATAACGCCT CGCTTGGCAC CTGAGCTTTA CTAAACCTA
1561 AGATCTTTCA TCTTGTTGA TCATTGTTTA ATA

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SEQ. ID. NO. 222

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1 MVFPIEAFVG LVTFTFLLYF LWTKKSQKLP KPLPPKIPGG WPVIGHLEHF NNDGDDRPLA
61 RKLGLDLADKY GPVFTFRLGL PLVLVSSYE ATKDCFSTND AIFSNRPAFL YGEYLGYNNT
121 MLFLANYGPY WRKNRKLVIQ EVLSASRLEK FKQVRFTRI TSIGNLYTRI NGNSSTINLT
181 DWLEELNFGI IVKMIAGKNY ESGKGDEQVE RFKNFAKDFM VLSMEFVLWD AFPIPLFKWV
241 DFQGHKTMK RTFKDIDSVF QNWLEEHINK REKMEVGAEG NEQDFIDVVL SKLSKEYLDE
301 GYSRDTVIAK TVFSLVLDAA DTVALHINWG MTLLINNQNA LMKAQEEIDT KVGKDRWVEE
361 SDIKDLVYLQ AIVKKVLRLY PPGPLLVPHE NVKDCVVSgy HIPKGTRLF NVMKLQRDPK
421 LLSNPDKDFP ERFIAGDIDF RGHHYEFIPS GSGRRSCPGM TYALQVEHLT MAHLIQGFNY
481 KTPNDEVLDL KEGAGITIRK VNPVELIITP RLAPELY

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NAME D208-AD9  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 223

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1 ATGCTTTCTC CCATAGAAGC CATTGTAGGA CTAGTAACCT TCACATTTCT CTTCTTCTTC
61 CTATGGACAA AAAAATCTCA AAAACCTTCA AAACCCTTAC CACCGAAAAT CCCC GGAGGA
121 TGGCCGGTAA TCGGCCATCT TTTCCACTTC AATGACGACG GCGACGACCG TCCATTAGCT
181 CGAAAACTCG GAGACTTAGC TGACAAATAC GGCCCCGTTT TCACTTTTCG GCTAGGCCTT
241 CCCCTTGTCT TAGTTGTAAG CAGTTACGAA GCTGTAAAAG ACTGTTTCTC CACAAATGAC
301 GCCATTTTTT CCAATCGTCC AGCTTTTCTT TACGGCGATT ACCTTGGCTA CAATAATGCC
361 ATGCTATTTT TGGCCAATTA CGGACCTTAC TGGCGAAAAA ATCGAAAATT AGTTATTCAG
421 GAAGTTCTCT CCGCTAGTCG TCTCGAAAAA TTCAAACACG TGAGATTTGC AAGAATTCAA
481 GCGAGCATGA AGAATTTATA TACTCGAATT GATGGAAATT CGAGTACGAT AAATTTAACT
541 GATTGGTTAG AAGAATTGAA TTTTGGTCTG ATCGTGAAGA TGATCGCTGG AAAAAATTAT
601 GAATCCGGTA AAGGAGATGA ACAAGTGGAG AGATTTAAGA AAGCGTTTAA GGATTTTATG
661 ATTTTATCAA TGGAGTTTGT GTTATGGGAT GCATTTCCAA TTCCATTATT TAAATGGGTG
721 GATTTTCAAG GGCATGTTAA GGCTATGAAA AGGACTTTTA AAGATATAGA TTCTGTTTTT
781 CAGAATTGGT TAGAGGAACA TATTAATAAA AGAGAAAAAA TGGAGGTAA TGCAGAAGGG
841 AATGAACAAG ATTTTCATTGA TGTGGTGCTT TCAAAAATGA GTAATGAATA TCTTGGTGAA
901 GGTACTCTC GTGATACTGT CATTGAAGCA ACGGTGTTTA GTTTGGTCTT GGATGCAGCA
961 GACACAGTTG CTCTTCACAT AAATTGGGGA ATGGCATTAT TGATAAACAA TCAAAAGGCC
1021 TTGACGAAAAG CACAAGAAGA GATAGACACA AAAGTTTGTA AGGACAGATG GGTAGAAGAG
1081 AGTGATATTA AGGATTTGGT ATACCTCCAA GCTATTGTTA AAGAAGTGTT ACGATTATAT
1141 CCACCAGGAC CTTTGTTAGT ACCACACGAA AATGTAGAAG ATTGTGTTGT TAGTGGATAT
1201 CACATTCCTA AAGGGACAAG ATTATTCGCA AACGTCATGA AACTGCAACG TGATCCTAAA
1261 CTCTGGTCTG ATCCTGATAC TTTCGATCCA GAGAGATTCA TTGCTACTGA TATTGACTTT
1321 CGTGGTCAGT ACTATAAGTA TATCCCGTTT GGTCTTGGA GACGATCTTG TCCAGGGATG
1381 ACTTATGCAT TGCAAGTGGA ACACCTAACA ATGGCACATT TGATCCAAGG TTTCAATTAC
1441 AGAACTCCAA ATGACGAGCC CTTGGATATG AAGGAAGGTG CAGGCATAAC TATACGTAAG
1501 GTAAATCCTG TGGAACTGAT AATAGCGCCT CGCCTGGCAC CTGAGCTTTA TTAAAACCTA
1561 AGATGTTTCA TCTTGGTTGA

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SEQ. ID. NO. 224

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1 MLSPIEAIIVG LVTFTFLFFF LWTKKSQKPS KPLPPKIPGG WPVIGHLFHF NDDGDDRPLA
61 RKLGLDLADKY GPVFTFRLGL PLVLVVSSEY AVKDCFSTND AIFS NRPAFL YGDYLGYNNA
121 MLFLANYGPY WRKQNRKLV IQ EVLSASRLEK FKHVRFARIQ ASMKNL YTRI DGNSSTINLT
181 DWLEELNFGL IVKMIAGKNY ESGKGDEQVE RFKKAFKDFM ILSMEFVLWD AFPIPLFKWV
241 DFQGHVKAMK RTFKDIDSVE QNWLEEHINK REKMEVNAEG NEQDFIDVVL SKMSNEYLGE
301 GYSRDTVIEA TVFSLVLDA DTV ALHINWG MALLINNQKA LTKAQEEIDT KVCKDRWVEE
361 SDIKDLVYLQ AIVKEVLRLY PPGPLLPHE NVEDCVVSGY HIPKGTRLFA NVMKLQRDPK
421 LWSDPDTFDP ERFIATDIDF RGQYYKYIPF GPGRRSCPGM TYALQVEHLT MAHLIQGFNY
481 RTPNDEPLDM KEGAGITIRK VNPVELIIAP RLAPELY

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NAME D237-AD1  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 225

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1 TTTCATATAC CTTTAGTACT CTTGAAATTT TCAAATAATG GTTTATCTTC TTTCTCCCAT
61 AGAAGCCATT GTAGGATTTG TAACCTTTTC ATTTCTATTC TACTTTCTAT GGACCAAAAA
121 ACAATCAAAA ATCTTAAACC CACTACCTCC AAAAATCCCA GGTGGATGGC CAGTAATCGG
181 CCATCTCTTT TATTTCAAGA ACAATGGCGA TGAAGATCGC CATTTTTCTC AAAAATCGG
241 TGACTTAGCT GACAAATATG GTCCCGTCTT CACTTTCCGG TTAGGGTTTC GCCGTTTCTT
301 GGCGGTGAGT AGTTATGAAG CTATGAAAGA ATGCTTCACT ACCAATGATA TCCATTTTCG
361 CGATCGGCCA TCTTTACTCT ACGGAGAATA CCTTGCTAT AATAACGCCA TGCTTGCTGT
421 TGCCAAATAT GGCCCTTACT GGAAAAAATA TCGAAAGTTA GTCAATCAAG AAGTTCTCTC
481 CGTTAGTCGG CTCGAAAAAT TCAAACATGT TAGATTTTCT ATAATTCAGA AAAATATTAA
541 ACAATTGTAT AATTGTGATT CACCAATGGT GAAGATAAAC CTTAGTGATT GGATAGATAA
601 ATTGACATTC GACATCATTT TGAAGATGGT TGTGGGAAG AACTATAATA ATGGACATGG
661 AGAAATATCT AAAGTTGCTT TTCAGAAATT CATGGTTCAA GCTATGGAGA TGGAGCTCTA
721 TGATGTTTTT CACATTCCAT TTTTCAAGTG GTTGGATCTT ACAGGGAATA TTAAGGCTAT
781 GAAACAAACT TTCAAAGACA TTGATAATAT TATCCAAGGT TGGTTAGATG AGCACATTAA
841 GAAGAGAGAA ACAAAGGATG TTGGAGGTGA AAACGAACAA GATTTTATAG ATGTGGTGCT
901 TTCCAAGATG AGCGACGAAC ATCTTGCGCA GGGTTACTCT CATGACACAA CCATCAAAGC
961 AACTGTATTC ACTTTGGTCT TGGATGCAAC AGACACACTT GCACTTCATA TAAAGTGGGT
1021 AATGGCGTTA ATGATAAACA ATAAGCATGT CATGAAGAAA GCACAAGAAG AGATGGACAC
1081 AATTGTTGGT AGAGATAGAT GGGTAGAAGA GAGTGATATC AAGAATTTGG TGTATCTCCA
1141 AGCAATTGTC AAAGAAGTAT TACGATTACA TCCACCCGCA CCTTTGTCAG TGCAACACCT
1201 ATCTGTAGAA GATTGTGTTG TCAATGGGTA CCATATTCCT AAGGGGACTG CACTACTTAC
1261 CAATATTATG AAATACAGC GAGATCCTCA AACATGGCCA AATCCTGATA AATTCGATCC
1321 AGAGAGATTC CTGACGACTC ATGCTACTAT TGACTACCGC GGGCAGCACT ATGAGTCGAT
1381 CCCCTTTGGT ACGGGGAGAC GAGCTTGTC CGCGATGAAT TATTCATTGC AAGTGGAAAC
1441 CCTTTCAATT GCTCATATGA TCCAAGGTTT CAGTTTTGCA ACTACGACCA ATGAGCCTTT
1501 GGATATGAAA CAAGGTGTGG GTTTAACTTT ACCAAAGAAG ACTGATGTTG AAGTGCTAAT
1561 TACACCTCGC CTTCTCCTA CGCTTTATCA ATATTAAGAT GTTTTGTTGT CGGGATTCGT
1621 TCTGATCAAT CCCTCAATG

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SEQ. ID. NO. 226

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1 MVYLLSPIEA IVGFVTFSTL FYFLWTKKQS KILNPLPPKI PGGWPEVIGHL FYFKINGDED
61 RHFSQKLGDL ADKYGPVFTF RLGRFRFLAV SSYEAMKECF TTNDIHFADR PSLLYGEYLC
121 YNNAMLAVAK YGPYWKKNRK LVNQEVLSVS RLEKFKHVRF SIIQKNIKQL YNCDSMPVKI
181 NLSDWIDKLT FDIILKMVVG KNYNNGHGEI LKVAFAQFMV QAMEMELYDV FHIPFFKWLD
241 LTGNIKAMKQ TFKDIDNIIQ GWLDEHIKKR ETKDVGGENE QDFIDVVLK MSDEHLGEGY
301 SHDTTIKATV FTLVLDTATD LALHIKWVMA LMINNKHVMK KAQEEMDTIV GRDRWVEESD
361 IKNLVYLQAI VKEVLRLHPP APLSVQHLSV EDCVVNGYHI PKGTALLTNI MKLQRDPQTW
421 PNPDKFDPER FLTTHATIDY RGQHYESI PF GTGRRACPAM NYSLQVEHLS IAHMIQGFST
481 ATTTNEPLDM KQGVGLTLPK KTDVEVLITP RLPPTLYQY

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NAME D125-AF11  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 227

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1 CTTTTTCTCC CCAAAAAAGA GCTCATTTCC CTTGTCCCCA AAAATGGATC TTCTCTTACT
61 AGAGAAGACC TTAATTGGTC TCTTCTTTGC CATTTTAATC GCTATAATTG TCTCTAGACT
121 TCGTTCAAAG CGTTTTAAGC TTCCCCCAGG ACCAATCCCA GTACCAGTTT TTGGTAATTG
181 GCTTCAAGTT GGTGATGATT TAAACCACAG AAATCTTACT GATTTTGCCA AAAAATTTGG
241 TGATCTTTTC TTGTAAAGAA TGGGCCAGCG TAATTTAGTT GTTGTGTCAT CTCCTGAATT
301 AGCTAAAGAA GTTTTACACA CACAAGGTGT TGAATTTGGT TCAAGAACAA GAAATGTTGT
361 ATTTGATATT TTTACTGGAA AAGGTCAAGA TATGGTTTTT ACTGTATATG GTGAACACTG
421 GAGAAAAATG AGGAGAATTA TGA CTGTACC ATTTTTTACT AATAAAGTTG TGCAGCAATA
481 TAGAGGGGGG TGGGAGTTTG AAGTGGCAAG TGTAATTGAG GATGTGAAGA AAAATCCTGA
541 ATCTGCTACT AATGGGATTG TATTAAGGAG GAGATTACAA TTGATGATGT ATAATAATAT
601 GTTTAGGATT ATGTTTGATA GGAGATTTGA GAGTGAAGAT GATCCTTTGT TTGTAAAGCT
661 TAAGGCTTTG AATGGTGAAA GGAGTAGATT GGCTCAGAGT TTTGAGTATA ATTATGGTGA
721 TTTTATTCCC ATTTTGAGGC CTTTTTTGAG AGGTTATTTG AAGATCTGTA AAGAAGTTAA
781 GGAGAAGAGG CTGCAGCTTT TCAAAGATTA CTTTGTGTGAT GAAAGAAAGA AGCTTTCAAAA
841 TACCAAGAGC TTGGACAGCA ATGCTCTGAA ATGTGCGATT GATCACATTC TTGAGGCTCA
901 ACAGAAGGGG GAGATCAATG AGGACAACGT TCTTTACATT GTTGAAAACA TCAATGTTGC
961 TGCTATAGAA ACCACATTAT GGTCAATTGA GTGGGGTATC GCCGAGTTAG TCAACCACCC
1021 TCACATCCAA AAGAACTCC GCGACGAGAT TGACACAGTT CTTGGCCCAG GAGTGCAAGT
1081 GACTGAACCA GACACCCACA AGCTTCCATA CCTTCAGGCT GTGATCAAGG AGACGCTTCG
1141 TCTCCGTATG GCAATTCCTC TATTAGTCCC ACACATGAAC CTTCACGATG CAAAGCTTGG
1201 CGGGTTTGAT ATTCCAGCAG AGAGCAAAAT CTTGGTTAAC GCTTGGTGGC TAGCTAACAA
1261 CCCGGCTCAT TGGAAAGAAAC CCGAAGAGTT CAGACCCGAG AGGTTCTTCG AAGAGGAGAA
1321 GCACGTTGAG GCCAATGGCA ATGACTTCAG ATATCTTCCG TTTGGCGTTG GTAGGAGGAG
1381 TTGCCCTGGA ATTATACTTG CATTGCCAAT TCTTGGCATT ACTTTGGGAC GTTTGGTTCA
1441 GAACTTTGAG CTGTTGCCTC CTCCAGGCCA GTCGAAGCTC GACACCACAG AGAAAGGTGG
1501 ACAGTTCAGT CTCCATATTT TGAAGCATTC CACCATTGTG TTGAAACCAA GGTCTTGCTG
1561 AACTTTCTGA TCCTAATCAA TTAAGGGGTT GAAGAAATTT TATAATTATG

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SEQ. ID. NO. 228

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1 MDLLLLLEKTL IGLFFAILIA IIVSRLRSKR FKLPPGPIPV PVFGNWLQVG DDLNHRNLTD
61 FAKKFGDLFL LRMGQRNLVV VSSPELAKEV LHTQGVEFGS RTRNVVFDIF TGKGQDMVFT
121 VYGEHWRKMR RIMTVPFFTN KVVQQYRGGW EFEVASVIED VKKNPESATN GIVLRRRLQL
181 MMYNNMFRIM FDRRFESEDD PLFVKLKALN GERSRLAQSF EYNYGDFIPI LRPFLRGYLK
241 ICEVKEKRL QLFKDYFVDE RKKLSNTKSL DSNALKCAID HILEAQQKGE INEDNVLYIV
301 ENINVAAIET TLWSIEWGIA ELVNHPHIQK KLRDEIDTVL GPGVQVTEPD THKLPLYLQAV
361 IKETLRLRMA IPLLVPHMNL HDAKLGGFDI PAESKILVNA WWLANNPAHW KKPEEFRPER
421 FFEKEKHVEA NGNDFRYLPF GVGRRSCPGI ILALPILGIT LGRLVQNFEL LPPPGQSKLD
481 TTEKGGQFSL HILKHSTIVL KPRSC

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NAME D134-AE11  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 229

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1  AACAATAAAA ATGGAGACAT TATTTAACAT CAAAGTTGCA GTTTCATTAG TAATTGTGAT
61 AATTTTCTG AGATGGGTAT GGAAATTCTT GAATTGGGTG TGGATTCAAC CAAAGAAAAT
121 GGAAAAAGA CTAAAAATGG AAGGTTTCAA AGGAAGCTCA TATAAGCTAT TATTTGGAGA
181 TATGAAAGAA ATAAATACAA TGGTTGAAGA AGCCAAAACC AAGCCTATGA ATTTTACCAA
241 GATTATGTG GCTAGAGTCT TGCCTCACTT CACAAAGTTG ATGCTCCAAT ATGGCAAGAA
301 TAGCTTTATG TGGTTAGGGC CAAAACCAAC AATGTTTATC ACAGACCCTG AACTAATAAG
361 GGAGATCTTG TCAAAAAGTT ACATATACCA GGAGATTCAA GGCAATCCAA TCACTAAGTT
421 GCTAGCACAA GGACTAGTAA GTTATGAAGC AGAGAAATGG GCTAAGCATA GAAAAATTAT
481 CAATCCTGCA TTTCACCTTG ACAAGTTGAA GCATATGCTA CCATCATTCT ACTTGAGTTG
541 TTGTGACATG CTCAGAAAAT GGGAAAGTAT AGCTTCATCA GAGGGATCAG AAATAGACGT
601 CTGGCCTTTT CTGGAACGCT TGACAAGCGA TGCTATTTCA AGAACAGCTT TTGGTAGTAA
661 CTATGAAGAC GGGAGACAGA TATTTGAGCT TCAAAAAGAA CAAGCTGAGT TGATTTTACA
721 AGCAGCGCGA TGGCTTTACA TCCCCGGATG GAGGTTTGTG CCAACAAAGA GGAACAAGAG
781 GATGAAGCAA ATCGCTAAAG AAGTACGATC ATTAGTGTTG GGAATAATCA ATAAGAGAAT
841 AAGGGAAATG AAAGCAGGGG AAGCTGCAAA AGATGACTTA CTGGGAATAC TATTGGAATC
901 TAATTTCAA GAAATCCAAA TGCACGGAAA CAAGAACTTT GGCATGACTA TCGACGAAGT
961 GATTGAAGAG TGCAAGTTAT TTTACTTTTG TGGGCAAGAA ACTACTTCAG TTTTGCTTGT
1021 TTGGACTTTG ATTTTACTGA GTAAGCATGT CGATTGGCAA GAAAGAGCTA GAGAAGAAGT
1081 TCATCAAGTC TTTGGAAGTA ACAAACCTGA TTATGACGCA TTGAATCAGT TGAAAGTTGT
1141 AACGATGATA TTCAACGAGG TTTTAAGGTT GTACCCACCG GGAATTACCA TAAGTCGAAC
1201 TGTACACGAG GATACCAAAT TAGGGAACTT GTCATTGCCA GCAGGGATAC AGCTTGTGTT
1261 ACCTGCAATT TGGTTGCATC ATGACAATGA AATATGGGGA GATGATGCAA AGGAGTTCAA
1321 ACCAGAGAGG TTTAGTGAAG GAGTTAATAA AGCAACAAAG GGTAAATTTG CATATTTTCC
1381 ATTTAGTTGG GGACCAAGAA TATGTGTTGG ACTGAATTTT GCAATGTTAG AGGCAAAAAT
1441 GGCACCTGCA TTGATTCTAC AACACTATGC TTTTGAGCTC TCTCCATCTT ATGCACATGC
1501 TCCTCATACA ATTATCACTC TGCAACCTCA ACATGGTGCT CCTTTGATTT TGCGCAAGCT
1561 GTAGCGCGGA TATATTGATT GGTATCTAC TGTAG

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SEQ. ID. NO. 230

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1  METLFNIKVA VSLVIVIIIFL RWVWKFLNWV WIQPKKMEKR LKMEGFKGSS YKLLFGDMKE
61 INTMVEEAKT KPMNFTNDYV ARVLPHF TKL MLQYGKNSFM WLGPKPTMFI TDP ELIREIL
121 SKSYIQEIQ GNPITKLLAQ GLVSYEAEKW AKHRKIINPA FHLDKLK HML PSFYLSCCDM
181 LRKWESIASS EGSEIDVWPF LETLTSDAIS RTAFGSNYED GRQIFELQKE QAEILQ AAR
241 WLYIPGWRFV PTKRNRKMKQ IAKEVRSVLV GIINKRIEM KAGEAAKDDL LGILLESNFK
301 EIQM HGKNKF GMTIDEVIEE CKLFYFAGQE TTSVLLVWTL ILLSKHVDWQ ERAREEVHQV
361 FGSNKP DYDA LNQLKVVTMI FNEVLR LYPF GITISRTVHE DTKLGNLSLP AGIQLVLP AI
421 WLHHDNEIWG DDAKEFKPER FSEGVNKATK GK FAYFPFSW GPRICVGLNF AMLEAKMALA
481 LILQHYAFEL SPSYAHAPHT IITLQPQ HGA PLILRKL

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NAME D209-AH12  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 231

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1 ATATGCAACT GAGATTTGAA GAATACCAAC TAACCAAAAT GCAGTTCTTC AGCTTGTTTT
61 CCATTTTCCT ATTTCTATCT TTCCTCTTTT TGTAAAGGAT ATGGAAGAAC TCCAATAGCC
121 AAAGCAAAAA GTTGCCACCA GGTCCATGGA AACTACCAAT ACTAGGAAGT ATGCTTCATA
181 TGGTTGGTGG ACTACCACAC CATGTCCTTA GAGATTTAGC CAAAAAATAT GGACCACTTA
241 TGCACCTTCA ATTAGGTGAA GTTCTGCGG TTGTGGTTAC TTCTCCTGAT ACGGCAAAAG
301 AAGATTAAAA AACTCATGAC ATCGCTTTTG CGTCTAGGCC TAGCCTTTTG GCCCGGAGA
361 TTGTCTGTTA CAATAGGTCT GATCTAGCCT TTTGCCCCTA TGGCGACTAT TGGAGACAAA
421 TGCCTAAAAT ATGTGTCTTG GAAGTGCTCA GTGCCAAGAA TGTTCCGACA TTTAGCTCTA
481 TTAGGCGGAA TGAAGTTCTT CGTCTCATT ATTATATCCG GTCATCTTCT GGTGAACCTA
541 TTAATGTTAC GGAAAGGATC TTTTGTGTTA CAAGCTCCAT GACATGTAGA TCAGCGTTTG
601 GGCAAGTGTT CAAAGAGCAA GACAAATTTA TACAATAAT TAAAGAAAGT ATACTCTTAG
661 CAGGAGGGTT TGATGTGGCT GACATATGCC CTTCACTGAA GTTCTTTCAT GTGTCAGTG
721 GAATGAAGGG TAAGATTATG AATGCACACC ATAAGGTAGA TGCCATTGTT GAGAATGTCA
781 TCAATGAGCA CAAGAAAAAT CTTGCAATTG GGAAAACTAA TGGAGCGTTA GGAGGTGAAG
841 ATTTAATTGA TGTTCTTCTA AGACTTATGA ATGATGGAGG CCTTCAATTT CCTATCACCA
901 ACGACAACAT CAAAGCCATA ATTTTGTGACA TGTTTGCTGC CGGGACAGAG ACTTCATCGT
961 CAACAATTGT GTGGGCTATG GTAGAAATGG TGA AAAATCC AGCCGTATTC GCGAAAGCTC
1021 AAGCAGAAGT AAGAGAAGCA TTTAGAGGAA AAGAACTTT CGATGAAAAT GATGTGGAGG
1081 AGCTAAACTA CCTAAAGTTA GTAATAAAG AAACCTAAG ACTTCATCCA CCGGTTCCAC
1141 TTTTGCTCCC AAGAGAATGT AGGGAAGAGA CAAATATAAA CGGCTACACT ATTCCTGTAA
1201 AGACCAAAGT CATGGTTAAT GTTTGGGCTT TGGGAAGAGA TCCAAAATAT TGGAATGACG
1261 CAGAAACTTT TATGCCAGAG AGATTTGAGC AGTGCTCTAA GGATTTTGTG GGTAAATAAT
1321 TTGAATATCT TCCATTTGGT GCGGGAAGGA GGATTTGTCC TGGGATTTCC TTTGGCTTAG
1381 CTAATGCTTA TTTGCCATTG GCTCAATTAC TATATCACTT CGATTGGAAA CTCCCTGCTG
1441 GAATCGAACC AAGCGACTTG GACTTGACTG AGTTGGTTGG AGTAACTGCC GCTAGAAAAA
1501 GTGACCTTTA CTTGGTTGCG ACTCCTTATC AACCTCCTCA AAAGTGATTT AATGGTTTCA
1561 AGTTTTTATT TCCTAGCAAA CCCCCTATT GTCCTATCTT TCTTTTGGTG TTTTCGGTTT
1621 TATCTACTCT AATACATGCA TCTTTTACCA TATAGGAATG TACCATGTTG TCG

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SEQ. ID. NO. 232

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1 MQLRFEEYQL TKMQFFSLVS IFLFLSFLFL LRIWKNSNSQ SKKLPPGPWK LPILGSMLHM
61 VGGLPHHVLRL DLAKKYGPLM HLQLGEVSAV VVTSPDTAKE VLKTHDIAFA SRPSLLAPEI
121 VCYNRSDLAF CPYGDYWRQM RKICVLEVL AKNVRTFSSI RRNEVLRLIN FIRSSSGEPI
181 NVTERIFLFT SSMTCRSAFG QVFKEQDKFI QLIKEVILLA GGFDVADIFP SLKFLHVLSG
241 MKGKIMNAHH KVDAIVENVI NEHKKNLAIK KTNLALGGED LIDVLLRLMN DGGLQFPITN
301 DNIKAIIFDM FAAGTETSSS TIVWAMVEMV KNPVAFKAQ AEVREAFGRK ETFDENDVEE
361 LNYLKLVIKE TLRHHPVPL LLPRECREET NINGYTIPVK TKVMVNVWAL GRDPKYWNDA
421 ETFMPEFEQ CSKDFVGNNF EYLPFGGGRR ICPGISFGLA NAYLPLAQLL YHFDWKLPAG
481 IEPSDLDLTE LVGVTAARKS DLYLVATPYQ PPQK

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NAME D221-BB8  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 233

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1 GAATTATTTT AC GTGTTGTA TTCCTTGTCT ATGATAGGAA GCTCGTTACC TCAGCGTACA
61 AACCCCAAAT AAAAAATGAA TTTCTTGTGT GTGTTAGCTT CTCTCTTTCT CTTTGTGTTT
121 CTAATGAGGA TAAGCAAAGC AAAAAAGCTC CCTCCAGGTC CAAGGAAACT GCCTATAATA
181 GGAAACCTTC ATCAAATTGG AAAATTACCT CATCGTTCAC TTCAAAAAC TTCTAATGAA
241 TATGGGGATT TCATTTTCTT GCAATTAGGT TCTGTACCGA CTGTGGTTGT CTCTCAGCT
301 GACATTGCCG GAGAGATCTT TAGAACTCAC GACCTTGTTT TCTCAGGCCG TCCTGCTTTA
361 TATGCTGCCA GAAAACCTTC CTACAATTGC TACAACGTTT CATTTCACAC CTATGGTAAT
421 TACTGGAGAG AGGCTCGGAA AATTCTAGTG TTGGAGTTGC TAAGTACAAA GAGAGTACAA
481 AGTTTCGAGG CAATTCGAGA CGAGGAAGTA AGTAGCTTGG TTCAAATTAT CTGTAGTTCC
541 TTGAGCTCAC CTGTTAACAT AAGCACATTA GCACTATCCT TGGCAAATAA CGTTGTTTGT
601 CGAGTGGCTT TTGGGAAAGG GAGTGCTGAA GGAGGAAATG ATTATGAGGA TAGGAAGTTT
661 AATGAAATTC TATATGAGAC ACAAGAATTA TTGGGTGAGT TTAACGTTGC TGATTATTTT
721 CCTCGGATGG CATGGATTAA CAAAATAAAT GGGTTTGATG AACGATTGGA AAATAATTTT
781 AGGGAATTGG ATAAGTTTTA TGACAAAGTA ATAGAAGATC ATCTTAATTC ATGTAGCTGG
841 ATGAAACAAA GGGATGATGA AGACGTTATT GATGTATTGC TTCGAATTCA AAAGGATCCA
901 AGCCAAGAAA TTCCTCTCAA AGATGATCAC ATTAAGGGCC TTCTTGCCGA TATATTCATA
961 GCTGGAAC TG ATACATCATC AACAAACATA GAATGGGCAA TGTCAGAACT CATAAAAAAT
1021 CCAAGAGTCT TGAGAAAAGC TCAAGAGGAA GTTAGAGAAG TTTCTAAGGG AAAACAAAAG
1081 GTCCAAGAAA GTGATCTTTG CAAACTAGAT TACTTGAAAT TGGTCATCAA AGAAACCTTT
1141 AGACTACACC CACCAGTCCC ATTACTAGTC CCTCGAGTAA CAACAGCCAG CTGCAAAAATA
1201 ATGGAATACG AAATTCCAGT AAATACAAGA GTCTTCATCA ACGCGACAGC AAATGGGACA
1261 AATCCAAAAT ACTGGGAAAA TCCATTGACA TTCTTGCCAG AGAGATTCTT GGATAAGGAG
1321 ATTGATTACA GAGGCAAAAA TTTTGAGTTG TTGCCATTG GGGCAGGGAG AAGAGGGTGT
1381 CCAGGAATTA ATTTTCAAT ACCACTTGTT GAGCTTGAC TGTCTAATCT ATTGTTTCAT
1441 TATAATTGGT CACTTCCTGA AGGGATGCTA GCTAAGGATG TTGATATGGA AGAAGCTTTG
1501 GGGATTACCA TGCACAAGAA ATCTCCCTT TGCTTAGTAG CTTCTCATTA TACTTGTTGA
1561 GATTTTAAAA GATTTTAGCA TAGCTATATA TAGCTTGAAG T

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SEQ. ID. NO. 234

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1 MNFLVVLASL FLFVFLMRIS KAKKLPPGPR KLPIIGNLHQ IGKLPHRSLQ KLSNEYGDFI
61 FLQLGSVPTV VVSSADIARE IFRTHDLVFS GRPALYAARK LSYNCYNVSF APYGNVWREA
121 RKILVLELLS TKRVQSFEAI RDEEVSSLVQ IICSSLSPV NISTLALS LA NNVVCRAVFG
181 KGS AEGGNDY EDRKFNEILY ETQELLGEFN VADYFPRMAW INKINGFDER LENNFRELDK
241 FYDKVIEDHL NSCSWMKQRD DEDVIDVLLR IQKDPSQEIP LKDDHIKGLL ADIFIAGTDT
301 SSTTIEWAMS ELIKNPRVLR KAQEEVREVS KGKQKVQESD LCKLDYLKLV IKETFR LHPP
361 VPLLVP RVTT ASCKIMEYEI PVNTRVFINA TANGTNPKYW ENPLTFLPER FLDKEIDYRG
421 KNFELLPGA GRGCPGINF SIPLVELALA NLLFHYNWSL PEGMLAKDVD MEEALGITMH
481 KKSPLCLVAS HYTC

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NAME D222-BH4  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 235

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1 CAAAGACTAA AAGATGTCGG TCTTTGCGGT TATTTTCATTC TTTCTACTTC TGTTTTTTCT
61 TTTCAAATCA TATTTGCCCT CATCGAAAAC AAAGAAAAAT TCTCCACCAT CTCCTTCAAA
121 GCTTCCGTTA ATCGGTCACT TCCACAAACT AGGCTTACAA CCTCACCGTT CTCTACAAAA
181 ACTATCAAAT GAACATGGTC CCATGATGAT GCTTCAATTC GGTAGCGTAC CTGTGCTTAT
241 CGCTTCATCA GCTGAAGCTG CTTCCGAAAT CATGAAAACC CAAGATTGTG CTTTTGCAAA
301 CAAACCCATT TCAACCATTC CTAGCAAAGCT TTTCTTCGGC CCAAAGGACG TTGCCTTCAC
361 CCCATATGGG GATTACTGGA GGAATGCCAG AAGCATTTCG ATGCTTCAGC TTTTGAACAA
421 CAAAAGAGTC CAGTCTTTTC GAAAGATAAG GGAAGAAGAG ACTTCTCTTC TTCTCCAGAG
481 GATTAGGGAA TCGCCAAATT CAGAAAGTCGA TTTAACGGAG CTGTTCGTTT CCATGACTAA
541 CGACATAGTT TGCAGGGTGG CCTTAGGAAG GAAGTATTGT GATGGGGAAG AAGGGAGGAA
601 ATCTAAGTCT TTGCTGTTAG AGTTTGTTGA ATTGTTGGGA GTTTTTAACA TTGGAGATTA
661 CATGCCGTGG CTTGCATGGA TGAATCGTTT CAATGGTTTG AATGCCAAAG TGGATAAAGT
721 GCGGAAAGAG TTTGATGCAT TTTTGGAGGA TGTGATTGAG GAACACGGAG GAAATAAGAA
781 ATCAGACACT GAAGCTGAAG GGGCAGACTT CGTGGATATA TTATTGCAGG TTCACAAAGA
841 AAACAAGGCT GGTTTTCAAG TCGAAATGGA TGCAATCAAA GCTATTATCA TGGATATGTT
901 TGCTGCGGGA ACAGATACAA CTTCCACGCT TCTAGAGTGG ACAATGAACG AGCTCTTAAG
961 AAATCCAAAA ACATTGAATA AGTTGAGAGA TGAGGTGAGA CAAGTGACTC AAGGGAAGAC
1021 AGAGGTAACA GAGGATGACT TAGAGAAAAAT GCCGTATTTA AGAGCAGCAG TTAAGGAGAG
1081 TTCCAGGCTA CACTCTCCAG TGCCACTTCT ACCTCGAGAA GCAATTAAGG ATGCAAAGGT
1141 TTTGGGCTAC GATATAGCTG CAGGGACTCA AGTCCTCGTT TGTCCATGGG CAATCTCAAG
1201 AGATCCAAAC CTTTGGGAAA ATCCAGAGGA GTTTC AACCT GAAAGATTCT TGGATACTTC
1261 CATAGATTAC AAAGGCTTAC ATTTGAGTT AATTCCATTC GGTGCAGGTC GGAGGGGTTG
1321 CCCTGGCATC ACATTGCTA AGTTTGTAAG TGAGCTAGCA TTGGCAAGAT TAATGTTCCA
1381 TTTTGATTTC TCGCTACCAA AAGGAGTTAA GCATGAGGAT TTGGACGTGG AGGAAGCTGC
1441 TGGAATTACT GTTAGAAGGA AGTCCCCCT TTTAGCCGTC GCCACTCCAT GCTCGTGATT
1501 TTTATTTTAG AGCTCATTCT ATGCCTTAAA AACTACTACT AGATAACTGC GTAGTAAATA
1561 ATGCTTGTA

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SEQ. ID. NO. 236

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1 MSVFAVISFF LLLFFLFKSY LPSSKTKKNS PPSPSKLPLI GHFHKLGLOP HRS LQKLSNE
61 HGPMMMLQFG SVPVLIASSA EAASEIMKTQ DLSFANKPIS TIPSKLFFGP KDVAFTPYGD
121 YWRNARSICM LQLLNKRVQ SFRKIREET SLLQRIRES PNSEVDLTEL FVSMTNDIVC
181 RVALGRKYCD GEEGRKF KSL LLEFVELLGV FNIGDYPWL AWMNRFNGLN AKVDKVAKEF
241 DAFLEDVIEE HGGNKSDTE AEGADFVDIL LQVHKENKAG FQVEMDAIKA IIMDMFAAGT
301 DTTSTLLEWT MNELLRNPKT LNKLRDEV RQ VTQ GKTEVTE DDLEKMPYLR AAVKESSRLH
361 SPVPLLPREA IKDAKVLGYD IAAGTQVLVC PW AISRDPNL WENPEEFQPE RFLDTSIDYK
421 GLHFELIPFG AGRRGCPGIT FAKFVNELAL ARLMFHFD FS LPKGVKHEDL DVEEAAGITV
481 RRFKPLLA VA TPCS

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NAME D224-AF10  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 237

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1 ATTATCCATC ACCTAAAATG GAGAATTCTT GGGTTTTTCT AGCCTTGGCA GGGCTATCTG
61 CATTAGCTTT TCTCTGTAAA ATAATCACCT GTCGAAGACC GGTAAACCGG AAAATACCAC
121 CAGGTCCAAA ACCATGGCCC ATCATTGGCA ATTTGAACCT ACTTGGTCCT ATACCACATC
181 AATCTTTTGA CTTGCTTTCC AAAAAATATG GAGAGTTGAT GCTGCTGAAA TTTGGCTCCA
241 GGCCAGTTCT TGTGCTTCA TCTGCTGAAA TGGCAAAACA GTTTTAAAA GTACATGATG
301 CTAATTTTCGC CTCCCGTCCT ATGCTAGCTG GTGGAAAGTA TACAAGCTAT AACTATTGTG
361 ACATGACATG GGCACCCTAT GGTCCCTATT GGCGCCAAGC ACGACGAATT TACCTTAACC
421 AGATATTTAC TCCGAAAAGG CTAGACTCGT TCGAGTACAT TCGTGTGAA GAAAGGCAGG
481 CCTTGATTTT CCAGCTGAAT TCCCTTGCTG GAAAGCCATT TTTTCTCAAA GACCATTTGT
541 CGCGATTTAG CCTCTGCAGC ATGACAAGGA TGGTTTTGAG CAACAAGTAC TTTGGTGAAT
601 CAACAGTTAG AGTAGAAGAT TTGCAGTACC TGGTAGATCA ATGGTTCTTA CTTAATGGTG
661 CTTTCAACAT TGGAGATTGG ATTCCATGGC TCAGCTTCTT GGACCTACAA GGCTATGTGA
721 AACAAATGAA GGCTTTGAAA AGAAGTTTGA ATAAGTTCCA CAACATTGTG CTAGATGATC
781 GCAGGGCTAA GAAGAATGCA GAGAAGAACT TTGTCCCAA AGACATGGTT GATGTCTTGT
841 TGAAGATGGC TGAAGATCCT AATCTGGAAG TCAAACCTAC TAATGACTGT GTCAAAGGGT
901 TAATGCAGGA TTTACTAAT GGAGGAACAG ATAGCTTAAC AGCAGCAGTG CAATGGGCAT
961 TTCAAGAACT TCTTAGACGG CCAAGGGTTA TTGAGAAGGC AACCGAAGAG CTTGACCGGA
1021 TTGTCGGGAA AGAGAGATGG GTAGAAGAGA AAGATTGCTC GCAGCTATCT TACGTTGAAG
1081 CAATCCTCAA GGAAACACTA AGGTTACATC CTCTAGGAAC TATGCTAGCA CCGCATTGTG
1141 CTATAGAAGA TTGTAACGTG GCTGGTTATG ACATACAGAA AGGAACGACC GTTCTGGTGA
1201 ATGTTTGGAC CATTGGAAGG GACCCAAAAT ACTGGGATAG AGCACAAGAG TTTCTCCCCG
1261 AGAGATTCTT AGAGAACGAC ATTGATATGG ACGGACATAA CTTTGCTTTC TTGCCATTTG
1321 GCTCGGGGCG AAGGAGGTGC CCTGGCTATA GCCTTGGACT TAAGGTTATC CGAGTAACAT
1381 TAGCCAACAT GTTGCATGGA TTCAACTGGA AATTACCTGA AGGTATGAAG CCAGAAGATA
1441 TAAGTGTTGA AGAACATTAT GGGCTCACTA CACATCCTAA GTTTCCTGTT CCTGTGATCT
1501 TGGAATCTAG ACTTTCTTCA GATCTCTATT CCCCCATCAC TTAATCCTAA GTGCTTCCTA
1561 TTATAGCATC ATATCAATAT CCCTC

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SEQ. ID. NO. 238

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1 MENSWFVFLAL AGLSALAFLC KIITCRRPVN RKIPPGPKPW PIIGNLNLG PIPHQSFDDL
61 SKKYGELMLL KFGSRPVLVA SSAEMAKQFL KVHDANFASR PMLAGGKYTS YNYCDMTWAP
121 YGPYWRQARR IYLNQIFTPK RLDSFEYIRV EERQALISQL NSLAGKPFLL KDHLRFSLC
181 SMTRMVLSNK YFGESTVRVE DLQYLVDQWF LLNGAFNIGD WIPWLSFLDL QGYVQMKAL
241 KRFTDFKHNI VLDDRRAKKN AEKNFVPKDM VDVLLKMAED PNLEVKL TND CVKGLMQDLL
301 TGGTDSLTA VQWAFQELLR RPRVIEKATE ELDRIVGKER WVEEKDCSQL SYVEAILKET
361 LRLHPLGTML APHCAIEDCN VAGYDIQKGT TVLVNVTIG RDPKYWDRAQ EFLPERFLEN
421 DIDMDGHNFA FLFPFGSRRR CPGYSLGLKV IRVTLANMLH GFNWKLP EGM KPEDISVEEH
481 YGLTTHPKFP VPVILESRLS SDLYSPIT

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NAME D224-BD11  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 239

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1 CTCATTATCC ATCACCTAAA ATGGAGAATT CTTGGGTTTT TCTAGCCTTG GCAGGGCTAT
61 CTGCATTAGC TTTTCTCTGT AAAATAATCA CCTGTCGAAG ACCGGTTAAC CGGAAAATAC
121 CACCAGGTCC AAAACCATGG CCCATCATTG GCAATTTGAA CCTACTTGGT CCTATACCAC
181 ATCAATCTTT TGAATTGCTT TCCAAAAAAT ATGGAGAGTT GATGCTGCTG AAATTTGGCT
241 CCAGGCCAGT TCTTGTTGCT TCATCTGCTG AAATGGCAAA ACAGTTTTTA AAAGTACATG
301 ATGCTAATTT CGCCTCCCGT CCTATGCTAG CTGGTGGAAG GTATACAAGC TATAACTATT
361 GTGACATGAC ATGGGCACCC TATGGTCCCT ATTGGCGCCA AGCACGACGA CGAATTTACC
421 TTAACCAGAT ATTTACTCCG AAAAGGCTAG ACTCGTTCGA GTACATTTCGT GTTGAAGAAA
481 GGCAGGCCTT GATTTCCCAG CTGAATTCCC TTGCTGGAAG GCCATTTTTT CTCAAAGACC
541 ATTTGTCGCG ATTTAGCCTC TGCAGCATGA CAAGGATGGT TTTGAGCAAC AAGTATTTTG
601 ATGAATCAAC AGTTAGAGTA GAAGATTTGC AGTACCTGGT AGATCAATGG TTCTTACTTA
661 ATGGTGCTTT CAACATTGGA GATTGGATTC CATGGCTCAG CTTCTTGGAC CTACAAGGCT
721 ATGTGAAACA AATGAAGGCT TTGAAAAGAA CTTTGTGATAA GTTCCACAAC ATTGTGCTAG
781 ATGATCACAG GGCTAAGAAG AATGCAGAGA AGAACTTTGT CCCAAAAGAC ATGGTTGATG
841 TCTTGTTGAA GATGGCTGAA GATCCTAATC TGGAAGTCAA ACTCATAAT GACTGTGTCA
901 AAGGGTTAAT GCAGGATTTA CTAAGTGGAG GAACAGATAG CTTAACAGCA GCAGTGCAAT
961 GGGCATTTC AAGAACTTCTT AGACAGCCAA GGGTTATTGA GAAGGCAACC GAAGAGCTTG
1021 ACCGGATTGT CGGGAAAGAG AGATGGGTAG AAGAGAAAGA TTGCTCGCAG CTATCTTACG
1081 TTGAAGCAAT CCTCAAGGAA AACTAAGGT TACATCCTCT AGGAACTATG CTAGCACCAG
1141 ATGTGCTAT AGAAGATTGT AACGTGGCTG GTTATGACAT ACAGAAAGGA ACGACCGTTC
1201 TGGTGAATGT TTGGACCAT GGAAGGGACC CAAAATACTG GGATAGAGCA CAAGAGTTTC
1261 TCCCCGAGAG ATTCTTAGAG AACGACATTG ATATGGACGG ACATAACTTT GCTTTCTTGC
1321 CATTTGGCTC GGGGCGAAGG AGGTGCCCTG GCTATAGCCT TGGACTTAAG GTTATCCGAG
1381 TAACATTAGC CAACATGTTG CATGGATTCA ACTGGAAATT ACCTGAAGGT ATGAAGCCAG
1441 AAGATATAAG TGTGGAAGAA CATTATGGGC TCACTACACA TCCTAAGTTT CCTGTTCTTG
1501 TGATCTTGA ATCTAGACTT TCTTCAGATC TCTATTCCCC CATCACTTAA TCCTAAGTGC
1561 TTCCTATTAT AGCATCATAT CAATATCCCT C

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SEQ. ID. NO. 240

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1 MENSWFLLAL AGLSALAFLC KIITCRRPVN RKIPPGPKPW PIIGNLNLG PIPHQSFDDL
61 SKKYGELMLL KFGSRPVLVA SSAEMAKQFL KVHDANFASR PMLAGGKYTS YNYCDMTWAP
121 YGPYWRQARR RIYLNQIFTP KRLDSFEYIR VEERQALISQ LNSLAGKPF LKDHLSRFSL
181 CSMTRMVLSN KYFGESTVRV EDLQYLVDQW FLLNGAFNIG DWIPWLSFLD LQGYVKQMK
241 LKRTFDKFNH IVLDDHRAK NAEKNFVPKD MVDVLLKMAE DPNLEVKL TNDCVKGLMQDL
301 LTGGTDSLTA AVQWAFQELL RQPRVIEKAT EELDRIVGKE RWVEEKDCSQ LSYVEAILKE
361 TLRLHPLGTM LAPHCAIEDC NVAGYDIQKG TTVLVNVWTI GRDPKYWDRA QEFLPERFLE
421 NDIDMDGHNH AFLPFGSGRR RCPGYSGLK VIRVTLANML HGFNWKLP EG MKPEDISVEE
481 HYGLTTHPKF PVPVILESRL SSDLYSPIT

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NAME D228-AD7  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 241

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1 TGATAATGCT CTTTCTACTC TTTGTAGCCC TTCCTTTCAT TCTTATTTTT CTTCTTCCTA
61 AATTCAAAAA TGGTGGAAAT AACAGATTGC CACCAGGTCC TATAGGTTTA CCATTCAATTG
121 GAAATTTGCA TCAATACGAT AGTATAACTC CTCATATCTA TTTTGGGAAA CTTTCAAAAA
181 AATATGGCAA AATCTTCTCA TTAAAACTTG CTTCTACTAA TGTGGTAGTA GTTCTTTCAG
241 CAAAATTAGC AAAAGAAGTA TTGAAAAAAC AAGATTTAAT ATTTTGTAGT AGACCATCTA
301 TTCTTGGCCA ACAAAAACCTG TCTTATTATG GTCGTGATAT TGCTTTTAAT GATTATTGGA
361 GAGAAATGAG AAAAATTTGT GTTCTTCATC TTTTGTAGTT AAAAAAGTT CAATTATTTA
421 GTCCAATTCG TGAAGATGAA GTTTTTAGAA TGATTAAGAA AATATCAAAA CAAGCTTCTA
481 CTTCACAAAATATTAATTTG AGTAATTTAA TGATTTCAAT AACAAGTACA ATTATTTGTA
541 GAGTTGCTTT TGGTGTTAGG ATTGAAGAAG AAGCACATGC AAGGAAGAGA TTTGATTTTC
601 TTTTGGCCGA GGCACAAGAA ATGATGGCTA GTTCTTTTGT ATCTGATTTT TTTCCCTTTT
661 TAAGTTGGAT TGATAAATTA AGTGGATTGA CATATAGACT TGAGAGGAAT TTCAAGGATT
721 TGGATAATTT TTATGAAGAA CTCATTGAGC AACATCAAAA TCCTAATAAG CCAAAATATA
781 TGAAGGAGA TATTGTTGAT CTTTTGCTAC AATTGAAGAA AGAGAAATTA ACACCCTTG
841 ATCTCACTAT GGAAGATATA AAAGGAATTC TCATGAATGT GTTAGTTGCA GGCACAGACA
901 CTAGTGCAGC TGCTACTGTT TGGGCAATGA CAGCCTTGAT AAAGAATCCT AAAGCCATGG
961 AAAAAGTTCA ATTAGAAATC AGAAAATCAG TTGGGAAGAA AGGCATTGTA AATGAAGAAG
1021 ATGTCCAAAA CATCCCTTAT TTTAAAGCAG TGATAAAGGA AATATTTAGA TTGTATCCAC
1081 CAGCTCCACT TTTAGTTCCA AGAGAATCAA TGGAAAAAAC CATATTAGAA GGTATGAAA
1141 TTCGGCCAAG AACCATAGTT CATGTTAACG CTTGGGCTAT AGCAAGGGAT CCTGAAATAT
1201 GGGAAAATCC AGATGAATTT ATACCTGAGA GATTTTGTAA TAGCAGTATC GATTACAAGG
1261 GTCAAGATTT TGAGTTACTT CCATTTGGTG CAGGCAGAAG AGGTTGCCCA GGTATTGCAC
1321 TTGGGGTTGC ATCCATGGAA CTTGCTTTGT CAAATCTTCT TTATGCATTT GATTGGGAGT
1381 TGCCTTATGG AGTAAAAAAA GAAGACATCG ACACAAACGT TAGGCCTGGA ATTGCCATGC
1441 ACAAGAAAAA CGAACTTTGC CTTGTCCCAA AAAATTATTT ATAAATTATA TTGGGACGTG
1501 GATCTCATGC TAGTTCTGTG CGGTCAGCTA AGCTTATTAT TTTTGGCTCA AATTATGTAT
1561 ACATAATTAG TACATGTTTA AAATGTATAA ATATAGTAGA ACCATTCTCA TGGTT

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SEQ. ID. NO. 242

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1 MLFLLFVALP FILIFLLPKF KNNGNNRLPP GPIGLPFIGN LHQYDSITPH IYFWKLSKKY
61 GKIFSLKLAS TNVVVVSSAK LAKEVLKKQD LIFCSRPSIL GQOKLSYYGR DIAFN DYWRE
121 MRKICVLHLF SLKKVQLFSP IREDEVFMI KKISKQASTS QIINLSNLM SLSTIICRV
181 AFGVRIEEEE HARKRDFLL AEAQEMMASF FVSDFFPFLS WIDKLSGLTY RLERNFKDLD
241 NFYEELIEQH QNPKNPKYME GDIVDLLLQL KKEKLTPLDL TMEDIKGILM NVLVAGSDTS
301 AAATVWAMTA LIKNPKAMEK VQLEIRKSVG KKGIVNEEDV QNIPYFKA VI KEIFRLYP PA
361 PLLVPRESME KTILEGYEIR PRTIVHVN AW AIARDPEIWE NPDEFIPERF LNSSIDYK GQ
421 DFELLFFGAG RRGCPGIALG VASMELALSN LLYAFDWELP YGVKKEDIDT NVRPGIAMHK
481 KNELCLVPKN YL

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NAME D228-AH8  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 243

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1  TGATAATGCT CTTTCTACTC TTTGTAGCCC TTCCTTTCAT TCTTATTTTT CTTCCTCCTA
61 AATTCAAAAA TGGTGGAAAT AACAGATTGC CACCAGGTCC TATAGGTTTA CCATTCATTG
121 GAAATTTGCA TCAATATGAT AGTATAACTC CTCATATCTA TTTTGGGAAA CTTTCCAAAA
181 AATATGGCAA AATCTTCTCA TTAAAACTTG CTTCTACTAA TGTGGTAGTA GTTCTTTCAG
241 CAAAATTAGC AAAAGAAAGTA TTGAAAAAAC AAGATTTAAT ATTTTGTAGT AGACCATCTA
301 TTCTTGGCCA ACAAAAACTG TCTTATTATG GTCGTGATAT TGCTTTTGCA CCTTATAATG
361 ATTATTGGAG AGAAATGAGA AAAATTTGTG TTCTTCATCT TTTTAGTTTA AAAAAAGTTC
421 AATTATTTAG TCCAATTCGT GAAGATGAAG TTTTLAGAAT GATTAAGAAA ATATCAAAAC
481 AAGCTTCTAC TTCACAAATT ATTAATTTGA GTAATTTAAT GATTTCATTA ACAAGTACAA
541 TTATTTGTAG AGTTGCTTTT GGTGTTAGGT TTGAAGAAGA AGCACATGCA AGGAAGAGAT
601 TTAGTTTCT TTTGGCCGAG GCACAAGAAA TGATGGCTAG TTTCTTTGTA TCTGATTTTT
661 TTCCCTTTTT AAGTTGGATT GATAAATTAA GTGGATTGAC ATATAGACTT GAGAGGAATT
721 TCAAGGATTT GGATAATTTT TATGAAGAAC TCATTGAGCA ACATCAAAAT CCTAATAAGC
781 CAAAATATAT GGAAGGAGAT ATTGTTGATC TTTTGCTACA ATTGAAGAAA GAGAAATTAA
841 CACCACTTGA TCTCACTATG GAAGATATAA AAGGAATTCT CATGAATGTG TTAGTTGCAG
901 GATCAGACAC TAGTGCAGCT GCTACTGTTT GGGCAATGAC AGCCTTGATA AAGAATCCTA
961 AAGCCATGGA AAAAGTTCAG TTAGAAATCA GAAAATCAGT TGGGAAGAAA GGCATTGTAA
1021 ATGAAGAAGA TGTCCAAAAC ATCCCTTATT TTAAAGCAGT GATAAAGGAA ATATTTAGAT
1081 TGTATCCACC AGCTCCACTT TTAGTTCCAA GAGAATCAAT GGAAAAAACC ATATTAGAAG
1141 GTTATGAAAT TCGGCCAAGA ACCATAGTTC ATGTTAACGC TTGGGCTATA GCAAGGGATC
1201 CTGAAATATG GGAAAAATCA GATGAATTTA TACCTGAGAG ATTTTGAAT AGCAGTATCG
1261 ATTACAAGGG TCAAGATTTT GAGTTACTTC CATTTGGTGC AGGCAGAAGA GGTGCCCAG
1321 GTATTGCACT TGGGGTTGCA TCCATGGAAC TTGCTTTGTC AAATCTTCTT TATGCATTTG
1381 ATTGGGAGTT GCCTTATGGA GTGAAAAAAG AAGACATCGA CACAAACGTT AGGCCTGGAA
1441 TTGCCATGCA CAAGAAAAAC GAACTTTGCC TTGTCCCAA AAATTATTTA TAAATTATAT
1501 TGGGACGTGG ATCTCATGCT AGTTCGTGTC GGTCAGCTAA GCTTATTATT TTTGGCTCAA
1561 ATTAGTGATA CATAATTAGT ACATGTTTAA AATGTATAAA TATAGTAGAA CCATTCTCAT
1621 GGTT

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SEQ. ID. NO. 244

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1  MLFLLFVALP FILIFLLPKF KNNGNRLPP GPIGLPFIGN LHQYDSITPH IYFWKLSKKY
61 GKIFSLKLAS TNVVVVSSAK LAKEVLKKQD LIFCSRPSIL GQOKLSYYGR DIAFAPYNDY
121 WREMRKICVL HLFSLKKVQL FSPIREDEVF RMIKKISKQA STSQIINLSN LMISLTSTII
181 CRVAFGVRF EEAHARKRFD FLLAEAQEMM ASFFVSDFFP FLSWIDKLSG LTYRLERNFK
241 DLDNFYEELI EQHQNPKNPK YMEGDIVDLL LQLKKEKLT LDLTMEDIKG ILMNVLVAGS
301 DTSAAATVWA MTALIKNPKA MEKVQLEIRK SVGKKGIVNE EDVQNIPIYFK AVIKEIFRLY
361 PPAPLLVPRE SMEKTILEGY EIRPRTIVHV NAWAIARDPE IWENPDEFIP ERFLNSSIDY
421 KGQDFELLFP GAGRRGCPGI ALGVASMELA LSNLLYAFDW ELPYGVKKED IDTNVRPGIA
481 MHKKNELCLV PKNYL

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NAME D235-AB1  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 245

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1 AAAATTCATA ATGGTTTTTC CCATAGAAGC CTTTGTAGGA CTAGTAACCT TCACATTTCT
61 CTTATACTTC CTATGGACAA AAAAATCTCA AAAACTTCCA AAACCCTTAC TACCGAAAAT
121 CCCC GGAGGA TGGCCGGTAA TCGGCCATCT TTTCAC TTC AATAACGACG GCGACGACCG
181 TCCATTAGCT CGAAAACTCG GAGACTTAGC TGATAAATAC GGCCCCGTTT TCACTTTTCG
241 GCTAGGTCTT CCCCTTGTGC TAGTTGTAAG CAGTTACGAA GCTATAAAAG ATTGCTTCTC
301 TACAAATGAC GCCATTTTCT CCAATCGTCC AGCTTTTCTT TACGGCGAAT ACCTTGGCTA
361 CAATAATACA ATGCTTTTTT TAGCAAATTA CGGACCTTAC TGGCGAAAAA ATCGTAAATT
421 AGTCATT CAG GAAGTTCTCT CTGCTAGTCG TCTCGAAAAA TTCAAACAAG TGAGATT CAC
481 CAGAATTCAA ACGAGCATTA AGAATTTATA CACTCGAATT AATGGAAATT CGAGTACGAT
541 AAATCTAACT GATTGGTTAG AAGAAATGGA TTTTGGTCTG ATCGTGAAAA TGATCGCTGG
601 GAAAAATTAT GAATCCGGTA AAGGAGATGA ACAAGTGGAA AGATTTAAGA ATGCGTTTAA
661 GGATTTTATG GTTTTATCAA TGGAAATTTGT ATTATGGGAT GCATTTCCAA TTCCATTATT
721 TAAATGGGTG GATTTTCAAG GTCATATTAA GGCAATGAAA AGGACATTTA AGGATATAGA
781 TTCTGTTTTT CAGAACTGGT TAGAGGAACA TATTAATAAA AGAGAAAAAA TGGAGGTTGG
841 TGCAGAAGGG AATGAACAAG ATTTTCATTGA TGTGGTGCTT TCAAAATTGA GTAAAGAATA
901 TCTTGATGAA GGTTACTCTC GTGATACTGT CATTAAGCA ACAGTTTTTA GTTTGGTCTT
961 GGATGCAGCA GACACAGTTG CTCTTCACAT AAATTGGGGA ATGACATTAT TGATAAACAA
1021 TC AAAATGCC TTGATGAAAG CACAAGAAGA GATAGACACA AAAGTTGGTA AGTATAGATG
1081 GGTAGAAGAG AGTGATATTA AGGATTTAGT ATACCTCCAA GCTATTGTTA AAAAGGTGTT
1141 ACGATTATAT CCACCAGGAC CTTTGTAGT ACCACATGAA TATGTAAAGG ATTGTGTTGT
1201 TAGTGGATAT CACATTCCTA AAGGGACTAG ATTATTCGCA AACGTCATGA AACTGCAGCG
1261 CGATCCTAAA CTCTTGTCAA ATCCTGATAA GTTCGATCCA GAGAGATTCA TCGCTGGTGA
1321 TATCGACTTC CGTGGTCACC ACTATGAGTT TATCCCATT TGGTTCTGGAA GACGATCTTG
1381 TCCGGGGATG ACTTATGCAT TGCAAGTGGG ACACCTAACA ATGGCACATT TAATCCAGGG
1441 TTTCAATTAC AAAACTCCAA ATGACGAGGC CTTGGATATG AAGGAAGGTG CAGGCATAAC
1501 AATACGTAAG GTAAATCCGG TGGAATTGAT AATAACGCCT CGCTTGGCAC CTGAGCTTTA
1561 CTAAACCTA AGATCTTTCA TCTTGGTTGA TCATTGTTTA ATACTCCTAG ATAGATGGGT
1621 ATTCATC

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SEQ. ID. NO. 246

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1 MVFPIEAFVG LVTFTFLLYF LWTKKSQKLP KPLLPKIPGG WPVIGHLFHF NNDGDDRPLA
61 RKLGD LADKY GPVFTFRLGL PLVLVVSSEY AIKDCFSTND AIFS NRPAFL YGEYLGYNNT
121 MLFLANYGPY WRKNRKLVIQ EVLSASRLEK FKQVRFTRIQ TSIKNLYTRI NGNSSTINLT
181 DWLEELDFGL IVKMIAGKNY ESGKGDEQVE RFKNAFKDFM VLSMEFVLWD AFPIPLFKWV
241 DFQGHKAMK RTFKDIDSVF QNWLEEHINK REKMEVGAEG NEQDFIDVVL SKLSKEYLDE
301 GYSRDTV IKA TVFSLVLDAA DTVALHINWG MTLLINNQNA LMKAQEEIDT KVGKYRWVEE
361 SDIKDLVYLQ AIVKKVLRLY PPGPLLVPHE YVKDCVVSGY HIPKGTRLFA NVMKLQRDPK
421 LLSNPDKFDP ERFIAGDIDF RGHYEFIPF GSGRRSCP GM TYALQVEHLT MAHLIQGFNY
481 KTPNDEALDM KEGAGITIRK VNPVELIITP RLAPELY

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NAME D243-AA2  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 247

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1 CAAAAAATCA TTTCTCTCGT CTAAAATGGA TCTTCTCTTA CTAGAGAAGA CCTTAATTGG
61 TCTTTTCTTT GCCATTTTAA TCGCTTTAAT TGTCTCTAAA CTTCGTTCAA AGCGTTTAA
121 GCTTCCTCCA GGACCAATTG CAGTACCAGT TTTTGGTAAT TGGCTTCAAG TTGGTGATGA
181 TTTAAACCAC AGAAATCTTA CTGATTATGC CAAAAAATTT GGCGATCTTT TCTTGTTAAG
241 AATGGGTCAA CGTAACTTAG TTGTTGTGTC ATCTCCTGAA TTAGCTAAAG AAGTTTTACA
301 CACACAAGGT GTTGAATTTG GTTCAAGAAC AAGAAATGTT GTGTTTGATA TTTTACTGG
361 AAAAGGTCAA GATATGGTTT TTACTGTATA TGGTGAACAT TGGAGAAAAA TGAGGAGAAT
421 TATGACTGTA CCATTTTTTA CTAATAAAGT TGTGCAACAG TATAGAGGGG GGTGGGAGTT
481 TGAGGTGGCA AGTGAATTG AGGATGTGAA AAAAAATCCT GAATCTGCTA CTAATGGGAT
541 CGTATTAAGG AGGAGATTAC AATTAATGAT GTATAATAAT ATGTTTAGGA TTATGTTTGA
601 TAGGAGATTT GAGAGTGAAG ATGATCCTTT GTTTGTTAAG CTTAAGGCTT TGAATGGTGA
661 AAGGAGTAGA TTGGCTCAAA GTTTTGAGTA TAATTATGGT GATTTTATTC CAATTTTGAG
721 GCCTCTTTTG AGAGGTTATT TGAAGATCTG TAAAGAAGTT AAGGAGAAGA GGCTGCAGCT
781 TTTCAAAGAT TACTTTGTTG ATGAAAGAAA GAAGCTTTCA AATACCAAGA GCTCGACAG
841 CAATGCCCTA AAATGTGCGA TTGATCACAT TCTTGAGGCT CAACAGAAGG GAGAGATCAA
901 TGAGGACAAC GTTCTTTACA TTGTTGAAAA CATCAATGTT CCTCACATCC AAACAACATT
961 ATGGTCAATT GAGTGGGGTA TCGCCGAGCT AGTCAACCAC CCTCACATCC AAAAGAAACT
1021 GCGCGACGAG ATTGACACAG TTCTTGGACC AGGAGTGCAA GTGACTGAAC CAGACACCCA
1081 CAAGCTTCCA TACCTTCAGG CTGTGATCAA GGAGGCACTT CGTCTCCGTA TGGCAATTCC
1141 TCTATTAGTC CCACACATGA ACCTTCACGA CGCAAAGCTT GGCGGGCTTG ATATTCCAGC
1201 AGAGAGCAAA ATCTTGGTTA ACGCTTGGTG GTTAGCTAAC AACCCGGCTC ATTGGAAGAA
1261 ACCCGAAGAG TTCAGACCCG AGAGGTTCTT TGAAGAGGAG AAGCATGTTG AGGCAATGG
1321 CAATGACTTC AGATATCTTC CGTTTGGCGT TGGTAGGAGG AGCTGCCCTG GAATTATACT
1381 TGCATTGCCA ATTCTTGGCA TCACCTTGGG ACGTTTGGTT CAGAACTTTG AGCTGTTGCC
1441 TCCTCCAGGC CAGTCGAAGC TCGACACCAC AGAGAAAGGT GGACAGTTCA GTCTCCACAT
1501 TTTGAAGCAT TCCACCATTG TGTGAAACC AAGGTCTTTC TGAACCTTGT GATCTTATTA
1561 ATTAAGGGGT TCTGAAGAAA TTTGATAGTG TTGG

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SEQ. ID. NO. 248

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1 MDLLLLLEKTL IGLFFAILIA LIVSKLRSKR FKLPPGPIPV PVFGNWLQVG DDLNHRNLTD
61 YAKKFGDLFL LRMGQRNLVV VSSPELAKEV LHTQGVFEGS RTRNVVFDIF TGKGQDMVFT
121 VYGEHWRKMR RIMTVPFFTN KVVQQYRGGW EFEVASVIED VKKNPESATN GIVLRRRLQL
181 MMYNNMFRIM FDRRFESEDD PLFVKLKALN GERSRLAQSF EYNYGDFIPI LRPLLRGYLK
241 ICKEVKEKRL QLFKDYFVDE RKKLSNTKSS DSNALKCAID HILEAQKKE INEDNVLYIV
301 ENINVAAIET TLWSIEWGIA ELVNHPIHQ KLRDEIDTVL GPGVQVTEPD THKLPLYLQAV
361 IKEALRLRMA IPLLVPHMNL HDAKLGLDI PAESKILVNA WWLANNPAHW KKPEEFRPER
421 FFEEEKHVEA NGNDFRYLPF GVGRRSCPGI ILALPILGIT LGRLVQNFEL LPPPGQSKLD
481 TTEKGGQFSL HILKHSTIVL KPRSF

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NAME D244-AD4  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 249

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1 AACATTTTGC AATATAGTTT TCCTAGTCAG TTCTAGCCTC CTTTTCCTTA GAAATAATGG
61 ATTATCATAT TTCTTTCCAT TTTCAAGCTC TTTTAGGGCT TTTAGCCTTT GTGTTCTTGT
121 CTATTATCTT ATGGAGAAGA ACACTCACTT CAAGAAAATT AGCCCCTGAA ATCCCAGGGG
181 CATGGCCTAT TATAGGCCAT CTTGCTCAGC TGAGTGGTAC TGATAAGAAT ATCCCATTTC
241 CCCGAATATT GGGCGCTTTG GCAGATAAAT ATGGACCTGT CTTACACTG AGAATAGGGA
301 TGTACCCCTA TTTGATTGTC AACAAATTGGG AAGCAGCTAA GGATTGTCTC ACAACGCATG
361 ATAAGGACTT CGCTGCCCCGA CCAACTTCTA TGGCTGGTGA AAGCATCGGG TACAAGTATG
421 CGAGGTTTAC TTATGCTAAT TTTGGTCCTT ATTATAACCA AGTGCACAAA CTAGCCCTAC
481 AACATGTACC CTCGAGTACT AAACTCGAGA AAATGAAACA CATACGTGTT TCTGAATTGG
541 AAAC TAGCAT CAAAGAATTA TATTCTTTGA CGCTGGGCAA AAACAACATG CAAAAAGTGA
601 ATATAAGTAA ATGGTTTGAA CAATTGACTT TAAACATAAT CGTGAAGACA ATTTGTGGCA
661 AGAGATATAG CAACATAGAG GAGGATGAAG AGGCACAACG TTTAGAAAAG GCATTTAAGG
721 GCATCATGTT TGTGTAGGG CAAATTGTTT TATATGACGC AATTCCATTC CCATTGTTCA
781 AATAC TTTGA TTTCCAAGGT CATATACAAT TGATGAACAA AATTTATAAA GACTTAGATT
841 CTATTCTTCA AGGATGGTTG GATGATCATA TGATGAACAA GGATGTAAAC AATAAGGATC
901 AAGATGCCAT AGATGCCATG CTTAAGGTAA CACAAC TTA TGAATTCAA GCCTATGGTT
961 TTTCTCAGGC CACTGTGATC AAGTCGACAG TCTTGAGTTT GATCTTAGAT GGAAATGACA
1021 CAACCGCTGT TCATTTGATA TGGGTAATGT CCTTATTACT GAACAATCCA CATGTTATGA
1081 AACAAGGCCA AGAAGAGATA GACATGAAAG TGGGTAAAGA GAGGTGGATT GAAGATACTG
1141 ACATAAAAAA TTTAGTGTAC CTTCAGGCTA TCGTTAAAGA GACATTGCGC TTGTATCCAC
1201 CTGTTCCCTT TCTTTTACCA CACGAAGCAG TGCAAGATTG TAAAGTGACT GGTTACCACA
1261 TTCCTAAAGG TACTCGTCTA TATATCAATG CGTGGAAAAGT ACATCGCGAT CCTGAAATTT
1321 GGTCAGAGCC CGAAAAGTTT ATGCCCAATA GATTCTTGAC TAGCAAAGCA AATATAGATG
1381 CTCGCGGTCA AAATTTTGAA TTTATACCGT TTGGTTCTGG GAGACGGTCA TGTCCAGGGA
1441 TAGGTTTTGC GACTTTAGTG ACACATCTGA CTTTTGGTCG CTTGCTTCAA GGTTTTGATT
1501 TTAGTAAGCC ATCAAACACG CCAATTGACA TGACAGAAGG CGTAGGCGTT ACTTTGCCTA
1561 AGGTTAATCA AGTTGAAGTT CTAATTACCC CTCGTTTACC TTCTAAGCTT TATTTATTTT
1621 GAAAGTGCAA ATCATCAATC ATGGCTTGAG TAATTAGTTA TACTTTAATA TGTTTCTC

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SEQ. ID. NO. 250

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1 MDYHISFHFQ ALLGLLAFVF LSIILWRRTL TSRKLAPEIP GAWPIIGHLR QLSGTDKNIP
61 FPRILGALAD KYGPVFTLRI GMPYPLIVNN WEAAKDCLTT HDKDFAARPT SMAGESIGYK
121 YARFTYANFG PYYNQVRKLA LQHVPSSTKL EKMKHIVSE LETSIKELYS LTLGKNMOMK
181 VNISKWFEQL TLNIIVK TIC GKRYSNIEED EEAQRFKAF KGIMFVVGQI VLYDAIPFPL
241 FKYFDFQGHI QLMNKIYKDL DSILQGWLDD HMMNKDVNNK DQDAIDAMLK VTQLNEFKAY
301 GFSQATVIKS TVLSLILDGN DTTAVHLI WV MSLLLNNPHV MKQGQEEIDM KVGKERWIED
361 TDIKNLVYLQ AIVKETLRLY PPVPFLLPHE AVQDCKVTGY HIPKGTRLYI NAWKVHRDPE
421 IWSEPEKFMP NRFLT SKANI DARGQNFEFI PFGSGRRSCP GIGFATLVTH LTFGRLLQGF
481 DFSKPSNTPI DMTEGVGVTL PKVNQVEVLI TPRLP SKLYL F

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NAME D247-AH1  
ORGANISM NICOTIANA TABACUM  
SEQ. ID. NO. 251

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1  TGATAATGCT CTTTCTACTC TTTGTAGCCC TTCCTTTCAT TCTTATTTTT CTTCTTCCTA
61 AATTCAAAAA TGGTGGAAAT AACAGATTGC CACCAGGTCC TATAGGTTTA CCATTTCATTG
121 GAAATTTGCA TCAATATGAT AGTATAACTC CTCATATCTA TTTTGGGAAA CTTTCCAAAA
181 AATATGGCAA AATCTTCTCA TTAAAACTTG CTTCTACTAA TGTGGTAGTA GTTCTTTCAG
241 CAAAATTAGC AAAAGAAGTA TTGAAAAAAC AAGATTTAAT ATTTTGTAGT AGACCATCTA
301 TTCTTGGCCA ACAAAAAC TGCTTTTGGCA CCTTATAATG
361 ATTATTGGAG AGAAATGAGA AAAATTTGTG TTCTTCATCT TTTTAGTTTA AAAAAAGTTC
421 AATTATTTAG TCCAATTCGT GAAGATGAAG TTTTGTAGAAT GATTAAGAAA ATATCAAAAC
481 AAGCTTCTAC TTCACAAATT ATTAATTTGA GTAATTTAAT GATTTCATTA ACAAGTACAA
541 TTATTTGTAG AGTTGCTTTT GGTGTTAGGT TTGAAGAAGA AGCACATGCA AGGAAGAGAT
601 TTGATTTTCT TTTGGCCGAG GCACAAGAAA TGATGGCTAG TTTCTTTGTA TCTGATTTTT
661 TTCCCTTTTT AAGTTGGATT GATAAATTAA GTGGATTGAC ATATAGACTT GAGAGGAATT
721 TCAAGGATTT GGATAATTTT TATGAAGAAC TCATTGAGCA ACATCAAAAT CCTAATAAGC
781 CAAAATATAT GGAAGGAGAT ATTGTTGATC TTTTGCTACA ATTGAAGAAA GAGAAATTAA
841 CACCACTTGA TCTCACTATG GAAGATATAA AAGGAATTCT CATGAATGTG TTAGTTGCAG
901 GATCAGACAC TAGTGCAGCT GCTACTGTTT GGGCAATGAC AGCCTTGATA AAGAATCCTA
961 AAGCCATGGA AAAAGTTCAA TTAGAAATCA GAAAATCAGT TGGGAAGAAA GGCATTGTAA
1021 ATGAAGAAGA TGTCCAAAAC ATCCCTTATT TTAAAGCAGT GATAAAGGAA ATATTTAGAT
1081 TGTATCCACC AGCTCCACTT TTAGTTCCAA GAGAATCAAT GGAAAAAACC ATATTAGAAG
1141 GTTATGAAAT TCGGCCAAGA ACCATAGTTC ATGTTAACGC TTGGGCTATA GCAAGGGATC
1201 CTGAAATATG GGAAAATCCA GATGAATTTA TACCTGAGAG ATTTTGAAT AGCAGTACCG
1261 ATTACAAGGG TCAAGATTTT GAGTTACTTC CATTTGGTGC AGGCAGAAGA GGTGCCCAG
1321 GTATTGCACT TGGGGTTGCA TCCATGGAAC TTGCTTTGTC AAATCTTCTT TATGCATTTG
1381 ATTGGGAGTT GCCTTATGGA GTGAAAAAAG AAGACATCGA CACAAACGTT AGGCCTGGAA
1441 TTGCCATGCA CAAGAAAAAC GAACTTTGCC TTGTCCCAA AAATTATTTA TAAATTATAT
1501 TGGGACGTGG ATCTCAATTT AGTTCTGTGA GGTGACG

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SEQ. ID. NO. 252

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1  MLFLLFVALP FILIFLLPKF KNGGNNRLPP GPIGLPFIGN LHQYDSITPH IYFWKLSKKY
61 GKIFSLKLAS TNVVVVSSAK LAKEVLKKQD LIFCSRPSIL GQQKLSYGR DIAFAPYNDY
121 WREMRKICVL HLFSLKKVQL FSPIREDEVF RMIKKISKQA STSQIINLSN LMISLTSTII
181 CRVAFGVRFE EEAHARKRFD FLLAEAQEMM ASFFVSDFFP FLSWIDKLSG LTYRLERNFK
241 DLDFNYEELI EQHQNPKNPK YMEGDIVDLL LQLKKEKLT LDLTMEDIKG ILMNVLVAGS
301 DTSAAATVWA MTALIKNPKA MEKVQLEIRK SVGKKGIVNE EDVQNIPIFK AVIKEIFRLY
361 PPAPLLVPRE SMEKTILEGY EIRPRTIVHV NAWAIARDPE IWENPDEFIP ERFLNSSTDY
421 KGQDFELLPF GAGRRGCPGI ALGVASMELA LSNLLYAFDW ELPYGVKKED IDTNVRPGIA
481 MHKKNELCLV PKNYL

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NAME D248-AA6  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 253

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1 CCAAAATCAT GGCTCTATCT TTCATATTCA TATCCATAAC CCTAATTTTT CTAGTTCATA
61 AACTCTACCA CCGTCTTAGA TTCAAACACTAC CACCAGGTCC GCGGCCGTTA CCGGTGGTCG
121 GAAACCTCTA CGACATAAAA CCGGTGAGAT TCCGGTGCTT TGCCGATTGG GCCAAAACCTT
181 ACGGTCCGAT TTTCTCAGTA TACTTTGGGT CACAGTTAAA TGTTGTGGTA ACAACAGCTG
241 AATTAGCTAA AGAAGTATTG AAAGAAAATG ACCAGAATTT AGCAGATAGA TTTAGGACTA
301 GACCTGCAAA TAATTTGAGC AGAAATGGGA TGGATTGAT TTGGGCTGAT TATGGGCCTC
361 ATTATGTGAA AGTAAGGAAG CTCTGTAATC TTGAGCTTTT TACTCCTAAA AGACTTGAAG
421 CTCTTAGACC TATTAGAGAA GATGAAGTTA CTGCTATGGT TGAAAACATT TTCAAGGATT
481 GTACTAAGCC TGATAACACA GGTAAAAGCT TGTTGATAAG AGAGTACTTA GGATCAGTAG
541 CATTCAACAA CATTACAAGG TTAACATTTG GGAAAAGGTT CATGAACTCA AAAGGTGAGA
601 TTGATGAGCA AGGTCAAGAA TTCAAGGGTA TTGCTCTTAA TGGCATCAAA ATTGGCGGAA
661 AACTTCCCTT GGCAGAGTAT GTTCCATGGC TCCGTTGGTT TTTCACAATG GAAAACGAGG
721 CACTCGTGAA GCACTCTGCA CGTAGAGACC GGTTAACAAG AATGATCATG GATGAACACA
781 CACTGGCTCG CAAGAAAAC TGTGATACTA AGCAGCATTT TGTCGATGCA TTGCTTACTC
841 TTCAGAAGCA GTATGATCTT AGTGATGACA CTGTTATTGG CCTCCTCTGG GATATGATTA
901 CAGCAGGAAT GGACACAACA ACCATAACAG TGGAAATGGG C AATGGCAGAA CTAGTTAAGA
961 ACCCAAGAGT GCAACTAAAA GCTCAAGAGG AGCTTGACAG GGTAATCGGA ACGGATCGAA
1021 TCATGTGAGA AACCGATTTT TCTAAACTTC CTTACCTACA ATGTGTAGCC AAAGAGGCTC
1081 TAAGGTTGCA CCCTCCAAC TCTCTAATGC TTCCTCATAA GGCCAGTGCC AGTGCACAAA
1141 TTGGTGGTTA TGACATTCCT AAGGGGTCCA TCGTGCACGT GAACGTTTGG GCTGTCGCTC
1201 GTGACCCAGC CGTGTGGAAG AACCCGTTGG AGTTCAGACC AGAGCGCTTC CTTGAGGAAG
1261 ACGTTGACAT GAAGGGTCAC GACTATCGGT TATTGCCCTT TGGTGCAGGA AGGCGTGTTC
1321 GCCCCGGTGC ACAACTTGCT ATCAACTTGG TCACATCTAT GTTGGGTCAT TTGTTGCATC
1381 ATTTTACATG GGCTCCGGCC CCGGGGGTTA ACCCGGAGGA TATTGACTTG GAGGAGAGCC
1441 CTGGAACAGT AACTTACATG AAAAATCCAA TACAAGCTAT TCCAACCTCA AGATTGCCTG
1501 CACACTTGTA TGGACGTGTG CCAGTGGATA TGTAACACAT TTTGTTCTTT CCCTTTTGG
1561 TTATATGATG AG

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SEQ. ID. NO. 254

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1 MALSFIFISI TLIFLVHKLY HRLRFKLPPG PRPLPVVGNL YDIKPVRFRC FADWAKTYGP
61 IFSVYFGSQL NVVVTTAELA KEVLKENDQN LADRFRTRPA NNLSRNGMDL IWADYGPHYV
121 KVRKLCNLEL FTPKRLEALR PIREDEVTAM VENIFKDCTK PDNTGKSLLI REYLGSVAFN
181 NITRLTFGKR FMNSKGEIDE QGQEFKGIVS NGIKIGGKLP LAEYVPWLRW FFTMENEALV
241 KHSARRDRLT RMIMDEHTLA RKKTGDTKQH FVDALLTLQK QYDLSDDTVI GLLWDMITAG
301 MDTTITVIEW AMAELVKNPR VQLKAQEELD RVIGTDRIMS ETDFSKLPYL QCVAKEALRL
361 HPPTPLMLPH KASASVKIGG YDIPKGSIVH VNVWAVARDP AVWKNPLEFR PERFLEEDVD
421 MKGHDYRLLP FGAGRVCPCG AQLAINLVTS MLGHLLHHFT WAPAPGVNPE DIDLEESPGT
481 VTYMKNPIQA IPTPRLPAHL YGRVPVDM

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NAME D249-AE8  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 255

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1 AATCACTAAT TTTTCATGTAC TCTCATAGGT CAAAAGTTTC AACC AAAATC ATGGCTCTAT
61 CCTTCATATT CATATCCATA ACCCTAATTT TTCTAGTTCA TAAACTCTAC CACCGTCTTA
121 GATTCAAACCT ACCACCAGGT CCGCGGCCGT TACCGGTGGT CGGAAACCTC TACGACATAG
181 AACCGGTGAG ATTCCGGTGC TTTGCCGATT GGGCCAAAAC TTACGGTCCG ATTTTCTCAG
241 TATACTTTGG GTCACAGTTA AATGTTGTGG TAACAACAGC TGAATTAGCT AAAGAAAGTAT
301 TGAAAGAAAA TGACCAGAAT TTAGCAGATA GATTTAGGAC TAGACCTGCA AATAATTTGA
361 GCAGAAATGG GATGGATTTG ATTTGGGCTG ATTATGGGCC TCATTATGTG AAAGTAAGGA
421 AGCTCTGTAA TCTTGAGCTT TTTACTCCTA AAAGACTTGA AGCTCTTAGA CCTATTAGAG
481 AAGATGAAGT TACTGCTATG GTTGAAAACA TTTTCAAGGA TTGTACTAAG CCTGATAACA
541 CAGGTAAAAG CTTGTTGATA AGAGAGTACT TAGGATCAGT AGCATTCAAC AACATTACAA
601 GGTAAACATT TGGGAAAAGG TTCATGAACT CAAAAGGTGA GATTGATGAG CAAGGTCAAG
661 AATTCAAGGG TATTGTCTCT AATGGCATCA AAATTGGCGG AAAACTTCCC TTGGCAGAGT
721 ATGTTCCATG GCTCCGTTGG TTTTTCACAA TGGAAAACGA GGCACCTCGT AAGCACTCTG
781 CACGTAGAGA CCGGTTAACA AGAATGATCA TGGATGAACA CACACTGGCT CGCAAGAAAA
841 CTGGTGATAC TAAGCAGCAT TTTGTCGATG CATTGCTTAC TCTTCAGAAG CAGTATGATC
901 TTAGTGATGA CACTGTTATT GGCTCCTCT GGGATATGAT TACAGCAGGA ATGGACACAA
961 CAACCATAAC AGTGGAATGG GCAATGGCAG AACTAGTTAA GAACCCAAGA GTGCAACTAA
1021 AAGCTCAAGA GGAGCTTGAC AGGGTAATCG GAACGGATCG AATCATGTCA GAAACCGATT
1081 TCTCTAAACT TCCTTACCTA CAATGTGTAG CCAAAGAGGC TCTAAGGTTG CACCCTCCAA
1141 CTCCTCTAAT GCTTCCTCAT AGGGCCAGTG CCAGTGTCAA AATTGGTGGT TATGACATTC
1201 CTAAGGGGTC CATCGTGCAC GTGAACGTTT GGGCTGTGCG TCGTGACCCA GCCGTGTGGA
1261 AGAACCCGTT GGAGTTCAGA CCAGAGCGCT TCCTTGAGGA AGACGTTGAC ATGAAGGGTC
1321 ACGACTATCG GTTATTGCCC TTTGGTGCAG GAAGGCGTGT TTGCCCCGGT GCACAACTTG
1381 CTATCAACTT GGTCAATCT ATGTTGGGTC ATTTGTTGCA TCATTTTACA TGGGCTCCGG
1441 CCCCAGGGGT TAACCCGGAG GATATTGACT TGGAGGAGAG CCCTGGAACA GTAACTTACA
1501 TGAAAAATCC AATACAAGCT ATTCCAACCT CAAGATTGCC TGCACACTTG TATGGACGTG
1561 TGCCAGTGGA TATGTAAAAAC

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SEQ. ID. NO. 256

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1 MYSHRSKVST KIMALSFIFI SITLIFLVHK LYHRLRFKLP PGPRPLPVVG NLYDIEPVRF
61 RCFADWAKTY GPIFSVYFGS QLNVVVTAE LAKEVLKEND QNLADRFRTR PANNL SRNGM
121 DLIWADYGPH YVKVRKLCNL ELFTPKRLEA LRPIREDEVT AMVENIFKDC TKPDNTGKSL
181 LIREYLGSA FNNITRLTFG KRFMNSKGEI DEQGQEFKGI VSNGIKIGGK LPLAEYVPWL
241 RWFFTMENEA LVKHSARRDR LTRMIMDEHT LARKKTGDTK QHFVDALLTL QKQYDLSDDT
301 VIGLLWDMIT AGMDTTTITV EWAMAEVLKN PRVQLKAQEE LDRVIGTDRI MSETDFSCLP
361 YLQCVAKEAL RLHPPTPLML PHRASASVKI GGYDIPKCSI VHVNVWAVAR DPAVWKNPLE
421 FRPERFLEED VDMKGHDYRL LPFGAGRRVC PGAQLAINLV TSMLGHLHH FTWAPAGVN
481 PEDIDLEESP GTVTYMKNPI QAIPTPLPA HLYGRVPVDM

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NAME D250-AC11  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 257

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1 ATAATGCTCT TTCTACTCTT TGTAGCCCTT CCTTTCATTC TTATTTTCT TCTTCCTAAA
61 TTCAAAAATG GTGGAAATAA CAGATTGCCA CCAGGTCCTA TAGGTTTACC ATTCATTGGA
121 AATTTGCATC AATATGATAG TATAACTCCT CATATCTATT TTTGGAAACT TTCCAAAAAA
181 TATGGCAAAA TCTTCTCATT AAAACTTGCT TCTACTAATG TGGTAGTAGT TTCTTCAGCA
241 AAATTAGCAA AAGAAGTATT GAAAAACAA GATTTAATAT TTTGTAGTAG ACCATCTATT
301 CTTGGCCAAC AAAAAGTCTC TTATTATGGT CGTGATATTG CTTTTCACAC TTATAATGAT
361 TATTGGAGAG AAATGAGAAA AATTTGTGTT CTTTCATCTTT TTAGTTTAAA AAAAGTTCAA
421 TTATTTAGTC CAATTCGTGA AGATGAAGTT TTTAGAATGA TTAAGAAAAT ATCAAAACAA
481 GCTTCTACTT CACAAATTAT TAATTTGAGT AATTTAATGA TTTCATTAAC AAGTACAATT
541 ATTTGTAGAG TTGCTTTTGG TGTTAGGTTT GAAGAAGAAG CACATGCAAG GAAGAGATTT
601 GATTTTCTTT TGGCCGAGGC ACAAGAAATG ATGGCTAGTT TCTTTGTATC TGATTTTCTT
661 CCCTTTTAA GTTAGATTGA CAAATTAAGT GGATTGACAT ATAGACTTGA GAGGAATTTT
721 AAGGATTTGG ATAATTTTAA TGAAGAACTC ATTGAGCAAC ATCAAAATCC TAATAAGCCA
781 AAATATATGG AAGGAGATAT TGTTGATCTT TTGCTACAAT TGAAGAAAGA GAAATTAACA
841 CCACTTGATC TCACTATGGA AGATATAAAA GGAATTCTCA TGAATGTGTT AGTTGCAGGA
901 TCAGACACTA GTGCAGCTGC TACTGTTTGG GCAATGACAG CCTTGATAAA GAATCCTAAA
961 GCCATGGAAA AAGTTCAATT AGAAATCAGA AAATCAGTTG GGAAGAAAAG CATTGTAAAT
1021 GAAGAAGATG TCCAAAACAT CCCTTATTTT AAAGCAGTGA TAAAGGAAAT ATTTAGATTG
1081 TATCCACCAG CTCCACTTTT AGTTCCAAGA GAATCAATGG AAAAAACCAT ATTAGAAGGT
1141 TATGAAATTC GGCCAAGAAC CATAGTTCAT GTTAACGCTT GGGCTATAGC AAGGGATCCT
1201 GAAATATGGG AAAATCCAGA TGAATTTATA CCTGAGAGAT TTTTGAATAG CAGTATCGAT
1261 TACAAGGGTC AAGATTTTGA GTTACTTCCA TTTGGTGCAG GCAGAAGAGG TTGCCCAGGT
1321 ATTGCACTTG GGGTTGCATC CATGGAACCT GCTTTGTCAA ATCTTCTTTA TGCATTTGAT
1381 TGGGAGTTGC CTTATGGAGT GAAAAAGAA GACATCGACA CAAACGTTAG GCCTGGAATT
1441 GCCATGCACA AGAAAAACGA ACTTTGCCTT GTCCCAAAAA AATTATTTAT AAATTATATT
1501 GGGACGTGGA TCTCATGCTA GTTCTGTGCG GTCAGCTAAG CTTA

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SEQ. ID. NO. 258

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1 MLFLLFVALP FILIFLLPKF KNNGNNRLPP GPIGLPFIGN LHQYDSITPH IYFWKLSKKY
61 GKIFSLKLAS TNVVVVSSAK LAKEVLKKQD LIFCSRPSIL GQQKLSYYGR DIAFAPYNDY
121 WREMRKICVL HLFSLKKVQL FSPIREDEVF RMIKKISKQA STSQIINLSN LMISLTSTII
181 CRVAFGVRFEE EEAHARKRFD FLLAEAQEMM ASFFVSDFFP FLS.IDKLSG LTYRLERNFK
241 DLDNFYEELI EQHQNPKNPK YMEGDIVDLL LQLKKEKLT LDLTMEDIKG ILMNVLVAGS
301 DTSAAATVWA MTALIKNPKA MEKVQLEIRK SVGKKGIVNE EDVQNIPYFK AVIKEIFRLY
361 PPAPLLVPRE SMEKTILEGY EIRPRTIVHV NAWAIARDPE IWENPDEFIP ERFLNSSIDY
421 KGQDFELLFP GAGRRGCPGI ALGVASMELA LSNLLYAFDW ELPYGVKKED IDTNVRPGIA
481 MHKKNELCLV PKKLFINYIG TWISC

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NAME D259-AB9  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 259

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1 CACATTGAGT CCTCTCCCAA ATCACTGATT CACCACCAAA AGTACCAACA ATTCAATGGA
61 AGGTACAAAC TTGACTACAT ATGCAGCAGT ATTTCTTGAT ACTCTGTTTC TTTTGTTTCT
121 TTCCAAACTT CTTCGCCAGA GGAAACTCAA TTTACCTCCA GGCCCAAAAC CATGGCCGAT
181 CATCGGAAAC TTAAACCTTA TTGGCAATCT TCCTCATCGC TCAATCCACG AACTCTCCCT
241 CAAGTACGGA CCCGTTATGC AACTCCAAAT CGGGTCTTTC CCCGTTGTAG TTGGATCCTC
301 CGTCGAAATG GCTAAGATTT TCCTCAAATC CATGGATATT AACTTTGTAG GCAGGCCTAA
361 AACGGCTGCC GGAAATACA CAACGTACAA TTATTCCGAT ATTACATGGT CTCCTTACGG
421 ACCATATTGG CGCCAGGCAC GTAGGATGTG CCTAACGGAA TTATTCAGCA CGAAACGTCT
481 CGATTACATC GAGTATATTC GGGCTGAGGA GTTGCAATCT CTCTCCATA ATTTGAACAA
541 AATATCAGGG AAACCAATTG TGTGAAAGA TTATTTGACG ACGTTGAGTT TAAATGTTAT
601 TAGCAGGATG GTACTGGGGA AAAGGTATTG GGACGAATCC GAGAATCGT TCGTGAATCC
661 TGAGGAATTT AAGAAGATGT TGGACGAATT GTTTTGTGTA AATGGTGTAC TTAATATTGG
721 AGATTCAATT CCATGGATTG ATTTTCATGGA TTTGCAAGGT TATGTTAAGA GGATGAAAGT
781 AGTGAGCAAG AAATTCGACA AGTTTTTAGA GCATGTTATT GATGAGCATA ACATTAGGAG
841 AAATGGAGTG GAGAATTATG TTGCTAAGGA TATGGTGGAT GTTTTGTTCG AGCTTGCTGA
901 TGATCCGAAG TTGGAAGTTA AGCTGGAGAG ACATGGAGTC AAAGCATTCA CTCAGGATAT
961 GCTGGCTGGT GGAACCGAGA GTTCAGCAGT GACAGTGGAG TGGGCAATTT CAGAGCTGCT
1021 AAAGAAGCCG GAGATTTTCA AAAAGGTAC AGAAGAATTG GATCGAGTAA TTGGGCAGAA
1081 TAGATGGGTA CAAGAAAAGG ACATTCCAAA TCTTCCTTAC ATAGAGGCAA TAGTCAAAGA
1141 GACTATGCGA CTGCACCCCG TGGCACCAAT GTTGGTGCCA CGTGAGTGTC GAGAAGATAT
1201 TAAGGTAGCA GGCTACGACG TTCAGAAAGG AACTAGGGTT CTCGTGAGTG TATGGACTAT
1261 TGGAAGAGAC CCTACATTGT GGGACGAGCC TGAGGTGTTT AAGCCGGAGA GATTCCATGA
1321 AAAGTCCATA GATGTTAAAG GACATGATTA TGAGCTTTTG CCATTGGAG CGGGGAGAAG
1381 AATGTGCCCG GGTATAGCT TGGGGCTCAA GGTGATTCAA GCTAGCTTAG CTAATCTTCT
1441 ACATGGATTT AACTGGTCAT TGCCTGATAA TATGACTCCT GAGGACCTCA ACATGGATGA
1501 GATTTTTGGG CTCTCTACAC CTAAAAAATT TCCACTTGCT ACTGTGATTG AGCCAAAGACT
1561 TTCACCAAAA CTTTACTCTG TTTGATTGAG CAGTTCTATG GTTCCGTCAG GATAG

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SEQ. ID. NO. 260

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1 MEGTNLTYYA AVFLDTLFL FLSKLLRQRK LNLPPGPKPW PIIGNLNLIG NLPHRSIHEL
61 SLKYGPVMQL QFGSFPVVVG SSVEMAKIFL KSMDINFVGR PKTAAGKYTT YNYSBITWSP
121 YGPYWRQARR MCLTELFSTK RLDSYHEYIRA EELHSLHLNL NKISGKPIVL KDYLTTLSLN
181 VISRMVLGKR YLDESENSFV NPEEFKMLD ELFLNGLVLN IGDSPWIDF MDLQGYVKRM
241 KVVSKKFDKF LEHVIDEHNI RRNGVENYVA KDMVDVLLQL ADDPKLEVKL ERHGVKFTQ
301 DMLAGGTESS AVTVEWAISE LLKKPEIFKK ATEELDRVIG QNRWVQEKDI PNLPIEIV
361 KETMRLHPVA PMLVPRECRE DIKVAGYDVQ KGTRVLVSVW TIGRDPTLWD EPEVFKPERF
421 HEKSIDVKGH DYELLFPFAG RRMCPGYSLG LKVIQASLAN LLHGFNWSLP DNMTPELNLN
481 DEIFGLSTPK KFPLATVIEP RLSPKLYSV

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NAME D218A-AC2  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 261

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1 CTTCTTCCTT CCTAACTAAA AATGGAGATT CAGTTTTCTA ACTTAGTTGC ATTCTTGCTC
61 TTTCTCTCCA GCATCTTTCT TGTATTCAAA AAATGGAAAA CCAGAAAACCT AAATTTGCCT
121 CCTGGTCCAT GGAAATTACC TTTTATTGGA AGTTTACACC ATTTGGCTGT GGCAGGTCCA
181 CTTCTCACC ATGGCCTAAA AAATTTAGCC AAACGCTATG GTCCTCTTAT GCATTTACAA
241 CTTGGACAAA TTCCTACACT CGTCATATCA TCACCTCAA TGGCAAAAGA AGTACTAAAA
301 ACTCACGACC TCGCTTTTGC CACTAGACCA AAGCTTGTCG TGGCCGACAT CATTCACTAC
361 GACAGCACGG ACATAGCACT TTCGCCATAC GGTGAATACT GGAGACAAAT TCGTAAATT
421 TGCATATTGG AACTCTTGAG TGCCAAGATG GTCAAGTTT TTAGCTCGAT TCGCCAAGAT
481 GAGCTCTCGA AGATGGTTTC ATCTATACGA ACGACGCCCA ATCTTCCAGT CAATCTTACC
541 GACAAGATTT TTTGGTTTAC GAGTTCGGTA ATTTGTAGAT CAGCTTTAGG GAAGATATGT
601 GGTGACCAAG ACAAATTGAT CATTTTTATG AGGGAAATAA TATCATTGGC AGGTGGATTT
661 AGTATTGCTG ATTTTTTCCC TACATGGAAA ATGATTCATG ATATTGATGG TTCAAATCT
721 AAAGTGGTGA AGGCACATCG TAAGATTGAT GAAATTTTGG AAAATGTGGT AAATGAGCAC
781 AAACAGAATC GAGCAGATGG TAAAAAGGGT AATGGTGAAT TTGGTGGAGA AGATCTGATT
841 GATGTTTTGT TAAGAGTTAG AGAAAGTGGA GAAAGTCAAA TTCCAATCAC AGATGACAAT
901 ATCAAATCAA TATTAATCGA CATGTTCTCT GCCGGATCGG AAACATCATC GACAACTATA
961 ATTTGGGCAT TAGCTGAAAT GATGAAGAAA CCAAGTGTTT TAGCAAAGGC ACAAGCTGAA
1021 GTGAGCCAAG CTTTGAAGGG GAAGAAAATT AGTTTCAAG AGATTGATAT TGATAAGCTA
1081 AAGTATTTGA AGTTAGTGAT CAAAGAACT TTAAGAATGC ACCCTCCAAT TCCTCTGTTA
1141 GTCCCTAGAG AATGTATGGA AGATACAAAG ATTGATGGT ACAATATACC TTTCAAAACA
1201 AGAGTCATTG TTAATGCATG GGCAATTGGA CGAGATCCTC AAAGTTGGGA TGATCCTGAA
1261 AGCTTTACGC CAGAGAGATT TGAGAATAAT TCTATTGATT TTCTTGGAAC TCATCATCAA
1321 TTTATTCCAT TTGGTGCAGG AAGAAGGATT TGTCCTGGAA TGCTATTTGG TTTAGCTAAT
1381 GTTGGACAAC CTTTAGCTCA GTTACTTTAT CACTTCGATT GGAAACTCCC TAATGGACAA
1441 ACTCACAAA ATTTGACAT GACTGAGTCA CCTGGAATTT CTGCTACAAG AAAGGATGAT
1501 CTTATTTTGA TTGCCACTCC TGCTCATTCT TGATTAAGTA TTGCTGCTTT TCTATTGGAG
1561 AATTTTCAA ATTCAATCC AATATATAGT GTTTGCTAGA GTTGGTTAGC

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SEQ. ID. NO. 262

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1 MEIQFSNLVA FLLFLSSIFL VFKKWKTRKL NLPPGPWKLP FIGSLHHLAV AGPLPHHGLK
61 NLAKRYGPLM HLQLGQIPTL VISSPQMAKE VLKTHDLAFA TRPKLVVADI IHYDSTDIAL
121 SPYGEYWRQI RKICILELLS AKMVKFFSSI RQDELSKMSV SIRTTPNLFP NLTDKIFWFT
181 SSVICRSALG KICGDQDKLI IFMREIISLA GGFSIADFFP TWKMIHDIDG SKSKLVKAHR
241 KIDEILENVV NEHKQNRADG KKGNGEFGGE DLIDVLLRVR ESGEVQIPIT DDNIKSILID
301 MFSAGSETSS TTIIWALAEM MKKPSVLAKA QAEVSQALKG KKISFQEIDI DKLKYLKLV
361 KETLRMHPII PLLVPREME DTKIDGYNIP FKTRVIVNAW AIGRDPQSWD DPESFTPERF
421 ENNSIDFLGN HHQFIPFGAG RRICPGMLFG LANVGQPLAQ LLYHFDWKLP NGQTHQNFDM
481 TESPGISATR KDDLILITP AHS

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NAME D210-BD4  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 263

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1 CTTTCATCAT ATGGCATGAA ATGGGAAATG CTCACAACAG CAAAATTGCA GCAATCTGTT
61 TGATAATTTT CTTGGTATAT AAAGCATGGG AATTGTTGAA GTGGATATGG ATTAAGCCAA
121 AGAACTGGA GAGTTGCCTC AGAAAACAGG GACTCAAAGG AAATtCCTAC GGGCTATTCT
181 ATGGAGATAT GAAAGAATtG TCCAAAAGTC TCAAGGAAAT CAATTCAAAG CCCATCATCA
241 ATCTATCAAA TGAAGTAGCC CCAAGAATCA TTCCTTATtA TCTTGAAATC ATCCAAAAAT
301 ATGGTAAAG ATGTTTTGTT TGGCAAGGAC CAACCCCCGC AATATTAATA ACAGAGCCAG
361 AATTAATAAA GGAGATATTT GGTAAGAACT ATGTTTTTCA GAAGCCTAAT AATCCCAACC
421 CACTGACCAA GTTATTGGCT CGAGGTGTTG TAAGCTACGA GGAAGAAAAA TGGGCAAAAC
481 ACAGAAAGAT CTTAAATCCT GCCTTTCATA TGGAGAAGTT GAAGCATATG CTACCAGCAT
541 TTTACTTGAG CTGTAGTGAG ATGCTGAACA AATGGGAGGA GATTATCCCA GTAAAAGAAT
601 CAAATGAGTT GGACATTTGG CCTCATCTTC AAAGAATGAC AAGTGATGTG ATTTCTCGTG
661 CTGCCTTTGG TAGTAGCTAC GAAGAAGGAA GAAGAATATT TGAAC TTCAA GAAGAACAAG
721 CTGAGTATCT AACGAAGACA TTCAATTCAG TTTATATCCC AGGTTCCAGA TTTTTCCTCA
781 ATAAAATGAA CAAAAGAATG AAAGAATGTG AAAAGGAAGT ACGAGAAACA ATTACGTGTC
841 TAATTGACAA CAGATTAAAG GCAAAAGAAG AAGGCAATGG CAAGGCCCTC AATGATGACC
901 TATTGGGTAT ATTATTAGAG TCAAATCTA TAGAAATTGA AGAACATGGT AACAAGAAGT
961 TTGGAATGAG TATACCTGAA GTAATTGAAG AGTGCAAATT ATTCTATTTT GCTGGCCAAG
1021 AGACTACATC AGTATTGCTT GTGTGGACAC TGATTTTGTT AGGGAGAAAt CCAGAATGGC
1081 AGGAACGTGC TAGAGAGGAA GTTTTTCAAG CCTTTGGAAG TGATAAAACCA ACTTTTGACG
1141 AATTATATCG CTTGAAAATG GTGACGATGA TTTTGTACGA GTCTTTAAGG TTATATCCAC
1201 CAATAGCAAC TCGTACTCGA AGGACTAATG AAGAAACAAA ATTAGGGGAA CTAGATTTAC
1261 CAAAGGGTGC ACTGCTCTTT ATACCAACAA TCTTATTACA TCTTGACAGG GAAATTTGGG
1321 GTGAAGATGC AGATGAGTTC AATCCGGAGA GATTTAGCGA AGGGGTGGCA AAGGCAACAA
1381 AGGGGAAAAAT GACATATTTT CCATTTGGTG CAGGACCGCG AAAATGCATT GGGCAAAACT
1441 TCGCGATTTT GGAAGCAAAA ATGGCTATAG CTATGATTCT ACAACGCTTC TCCTTCGAGC
1501 TCTCTCCATC TTATACACAC TCTCCATACA CTGTGGTCAC TTTGAAACCC AAATATGGTG
1561 CTCCCCTAAT AATGCACAGG CTGTAGTCCT GTGAGAATAT GCTATCCGAG G

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SEQ. ID. NO. 264

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1 MGNAHNSKIA AICLIIFLVY KAWELLKWIW IKPKKLESCL RKQGLKNSY GLFYGDMKEL
61 SKSLKEINSK PIINLSNEVA PRIIPYYLEI IQKYGKRCFV WQGPTPAILI TEPELIKEIF
121 GKNYVFQKPN NPNPLTKLLA RGVVSYEEEEK WAKHRKILNP AFHMEKLKHM LPAFYLSLSE
181 MLNKWEEIIP VKESNELDIW PHLQRM TSDV ISRAAFGSSY EEGRRIFELQ EEQAEYLTKT
241 FNSVYIPGSR FFPNKMNMKRM KECEKEVRET ITCLIDNRLK AKEEGNGKAL NDDLGLILLE
301 SNSIEIEEHG NKKFGMSIPE VIEECKLFYF AGQETTSVLL VWTLLILLGRN PEWQERAREE
361 VFQAFGSDKP TFDELYRLKI VTMIYESLR LYPPIATRTR RTNEETKLGE LDLPKGALLF
421 IPTILLHLDR EIWGEDADEF NPERFSEGVA KATKGKMTYF PFGAGPRKCI GQNF AILEAK
481 MAIAMILQRF SFELSPSYTH SPYTVVTLKP KYGAPLIMHR L

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NAME D233-AG7  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 265

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1 CTCATTATCC ATCACCTAAA ATGGAGAATT CTTGGGTTTT TCTAGCCTTG GCAGGGCTAT
61 CTGCATTAGC TTTTCTCTGT AAAATAATCA CCTGTCGAAG ACCGGTTAAC CGGAAAATAC
121 CACCAGGTCC AAAACCATGG CCCATCATTG GCAATTTGAA CCTACTTGGT CCTATACCAC
181 ATCAATCTTT TGAATTGCTT TCCAAAAAAT ATGGAGAGTT GATGCTGCTG AAATTTGGCT
241 CCAGGCCAGT TCTTGTTGCT TCATCTGCTG AAATGGCAAA ACAGTTTTTA AAAGTACATG
301 ATGCTAATTT CGCCTCCCGT CCTATGCTAG CTGGTGGAAA GTATACAAGC TATAACTATT
361 GTGACATGAC ATGGGCACCC TATGGTCCCT ATTGGCGCCA AGCACGACGA ATTTACCTTA
421 ACCAGATATT TACTCCGAAA AGGCTAGACT CGTTCGAGTA CATTCTGTGT GAAGAAAGGC
481 AGGCCTTGAT TTCCCAGCTG AATTCCCTTG CTGGAAGGCC ATTTTTTCTC AAAGACCATT
541 TGTGCGGATT TAGCCTCTGC AGCATGACAA GGATGGTTTT GAGCAACAAG TATTTTGGTG
601 AATCAACAGT TAGAGTAGAA GATTTGCAGT ACCTGGTAGA TCAATGGTTC TTACTTAATG
661 GTGCTTTCAA CATTGGAGAT TGGATTCCAT GGCTCAGCTT CTTGGACCTA CAAGGCTATG
721 TGAACAAAT GAAGGCTTTG AAAAGAACTT TTGATAAGTT CCACAACATT GTGCTAGATG
781 ATCACAGGGC TAAGAAGAAT GCAGAGAAGA ACTTTGTCCC AAAAGACATG GTTGATGTCT
841 TGTGGAAGAT GGCTGAAGAT CCTAATCTGG AAGTCAAACT CACTAATGAC TGTGTCAAAG
901 GGTAAATGCA GGATTTACTA ACTGGAGGAA CAGATAGCTT AACAGCAGCA GTGCAATGGG
961 CATTTCAAGA ACTTCTTAGA CAGCCAAGGG TTATTGAGAA GGCAACCGAA GAGCTTGACC
1021 GGATTGTCCG GAAAGAGAGA TGGGTAGAAG AGAAAGATTG CTCGCAGCTA TCTTACGTTG
1081 AAGCAATCCT CAAGGAAACA CTAAGGTTAC ATCCTCTAGG AACTATGCTA GCACCGCATT
1141 GTGCTATAGA AGATTGTAAC GTGGCTGGTT ATGACATACA GAAAGGAACG ACCTTTCTGG
1201 TGAATGTTTG GACCATTGGA AGGGACCCAA AATACTGGGA TAGAGCACAA GAGTTTCTCC
1261 CCGAGAGATT TTTAGAGAAC GACATTGATA TGGACGGACA TAACTTTGCT TTCTTGCCAT
1321 TTGGCTCGGG GCGAAGGAGG TGCCCTGGCT ATAGCCTTGG ACTTAAGGTT ATCCGAGTAA
1381 CATTAGCCAA CATGTTGCAT GGATTCAACT GGAAATTACC TGAAGGTATG AAGCCAGAAG
1441 ATATAAGTGT GGAAGAACAT TATGGGCTCA CTACACATCC TAAGTTTCCT GTTCTGTGA
1501 TCTTGGAATC TAGACTTTCT TCAGATCTCT ATTCCCCCAT CACTTAATCC TAAGTGCTTC
1561 CTATTATAGC

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SEQ. ID. NO. 266

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1 MENSWVFLAL AGLSALAFLC KIITCRRPVN RKIPPGPKPW FIIGNLNLG PIPHQSFDDL
61 SKKYGELMLL KFGSRPVLVA SSAEMAKQFL KVHDANFASR PMLAGGKYTS YNYCDMTWAP
121 YGPYWRQARR IYLNQIFTPK RLDSFEYIRV EERQALISQL NSLAGKPFFL KDHLRSFSLC
181 SMTRMVLSNK YFGESTVRVE DLQYLVDQWF LLNGAFNIGD WIPWLSFLDL QGYVKQMKAL
241 KRTFDKFHNI VLDDHRAKKN AEKNFVPKDM VDVLLKMAED PNLEVKL TND CVKGLMQDLL
301 TGGTDSLTA VQWAFQELLR QPRVIEKATE ELDRIVGKER WVEEKDCSQL SYVEAILKET
361 LRLHPLGTML APHCAIEDCN VAGYDIQKGT TFLVNVWTIG RDPKYWDRAQ EFLPERFLEN
421 DIDMDGHNFA FLPGSGRRR CPGYSLGLKV IRVTLANMLH GFNWKLPEGM KPEDISVEEH
481 YGLTTHPKFP VPVILESRLS SDLYSPIT

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NAME D257-AE4  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 267

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1 CACATTGAGT CCTCTCCCAA ATCACTGATT CACCACCAAA AGTACCAACA ATTCAATGGA
61 AGGTACAAAC TTGACTACAT ATGCAGCAGT ATTTCTTGAT ACTCTGTTTC TTTTGTTCCT
121 TTCCAAACTT CTTGCCGAGA GGAAACTCAA TTTACCTCCA GGCCCAAAAC CATGGCCGAT
181 CATCGGAAAC TTAAACCTTA TTGGCAATCT TCCTCATCGC TCAATCCACG AACTCTCCCT
241 CAAGTACGGA CCCGTTATGC AACTCCAATT CGGGTCTTTC CCCGTTGTAG TTGGATCCTC
301 CGTCGAAATG GCTAAGATTT TCCTCAAATC CATGGATATT AACTTTGTAG GCAGGCCTAA
361 AACGGCTGCC GGAAAATACA CAACGTACAA TTATTCCGAT ATTACATGGT CTCCTTACGG
421 ACCATATTGG CGCCAGGCAC GTAGGATGTG CCTAACGGAA TTATTACGCA CGAAACGTCT
481 CGATTCATAC GAGTATATTC GGGCTGAGGA GTTGCAATTCT CTTCTCCATA ATTTGAACAA
541 AATATCAGGG AAACCAATTG TGTGAAAGA TTATTTGACG ACGTTGAGTT TAAATGTTAT
601 TAGCAGGATG GTACTGGGGA AAAGGTATTT GGACGAATCC GAGAACTCGT TCGTGAATCC
661 TGAGGAATTT AAGAAGATGT TGGACGAATT GTTTTGTGCTA AATGGTGTAC TTAATATTGG
721 AGATTCAATT CCATGGATTG ATTTCAATGGA TTTGCAAGGT TATGTTAAGA GGATGAAAGT
781 AGTGAGCAAG AAATTCGACA AGTTTTTAGA GCATGTTATT GATGAGCATA ACATTAGGAG
841 AAATGGAGTG GAGAATTATG TTGCTAAGGA TATGGTGGAT GTTTTGTGTC AGCTTGCTGA
901 TGATCCGAAG TTGGAAGTTA AGCTGGAGAG ACATGGAGTC AAAGCATTCA CTCAGGATAT
961 GCTGGCTGGT GGAACCGAGA GTTCAGCAGT GACAGTGGAG TGGGCAATTT CAGAGCTGCT
1021 AAAGAAGCCG GAGATTTTCA AAAAGGCTAC AGAAGAATTG GATCGAGTAA TTGGGCAGAA
1081 TAGATGGGTA CAAGAAAAGG ACATTTCCAAA TCATCCTTAC ATAGAGGCAA TAGTCAAAGA
1141 GACTATGCGA CTGCACCCCG TGGCACCAAT GTTGGTGCCA CGTGAGTGTC GAGAAGATAT
1201 TAAGGTAGCA GGCTACGACG TTCAGAAAGG AACTAGGGTT CTCGTGAGTG TATGGACTAT
1261 TGGAAGAGAC CCTACATTGT GGGACGAGCC TGAGGTGTTT AAGCCGGAGA GATTCCATGA
1321 AAAGTCCATA GATGTTAAAG GACATGATTA TGAGCTTTTG CCATTTGGAG CGGGGAGAAG
1381 AATGTGCCCG GGTATAGCT TGGGGCTCAA GGTGATTCAA GCTAGCTTAG CTAATCTTCT
1441 ACATGGATTT AACTGGTCAT TGCCTGATAA TATGACTCCT GAGGACCTCA ACATGGATGA
1501 GATTTTTTGGG CTCTCTACAC CTA AAAAAT TCCACTTGCT ACTGTGATTG AGCCAAGACT
1561 TTCACCAAAA CTTTACTCTG TTTGATTGAG CAGTTCTATG GATCCGTCAA GATAGAC

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SEQ. ID. NO. 268

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1 MEGTNLTYYA AVFLDTLFLF FLSKLLRQRK LNLPPGPKPW PIIGNLNLIG NLPHRSIHEL
61 SLKYGPVMQL QFGSFPVVVG SSVEMAKIFL KSMDINFVGR PKTAAGKYTT YNYSBITWSP
121 YGPYWRQARR MCLTELFSTK RLDSYFYIRA EELHSLHNL NKISGKPIVL KDYLTTLSLN
181 VISRMVLGKR YLDESENSFV NPPEEFKMLD ELFLNLGVN IGDSIPWIDF MDLQGYVKRM
241 KVVSKKFDKF LEHVIDEHNI RRNGVENYVA KDMVDVLLQL ADDPKLEVKL ERHGVKAFQ
301 DMLAGGTESS AVTVWEAISE LLKKPEIFKK ATEELDRVIG QNRWVQEKDI PNHPYIEAIV
361 KETMRLHPVA PMLVPRECRE DIKVAGYDVQ KGTRVLVSVW TIGRDPTLWD EPEVFKPERF
421 HEKSIDVKGH DYELLPGFAG RRMCPGYSLG LKVIQASLAN LLHGFNWSLP DNMTPELDNM
481 DEIFGLSTPK KFPLATVIEP RLSPKLYSV

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NAME D268-AE2  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 269

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1 TGCAATATAG TTTTCCTAGT CAGTTC TAGC CTCCTTTTCC TTAGAAATAA TGGATTATCA
61 TATTTCTTTC CATTTTCAAG CTCTTTTAGG GCTTTTAGCC TTTGTGTTCT TGTCTATTAT
121 CTTATGGAGA AGAACTCA CTTCAAGAAA ATTAGCCCCT GAAATCCCAG GGGCATGGCC
181 TATTATAGGC CATCTTCGTC AGCTGAGTGG TACTGATAAG AATATCCCAT TTCCCCGAAT
241 ATTGGGCGCT TTGGCAGATA AATATGGACC TGTCTTCACA CTGAGAATAG GGATGTACCC
301 CTATTTGATT GTCAACAATT GGAAGCAGC TAAGGATTGT CTCACAACGC ATGATAAGGA
361 CTTGCGTGCC CGACCAACTT CTATGGCTGG TGAAAGCATC GGGTACAAGT ATGCGAGGTT
421 TACTTATGCT AATTTTGGTC CTTATTATAA CCAAGTGCGC AAAGTAGCCC TACAACATGT
481 ACTCTCGAGT ACTAACTCG AGAAAATGAA ACACATACGT GTTTCTGAAT TGGAAACTAG
541 CATCAAAGAA TTATATTCTT TGACGCTGGG CAAAACAAC ATGCAAAAAG TGAATATAAG
601 TAAATGGTTT GAACAATTGA CTTTAAACAT AATCGTGAAG ACAATTTGTG GCAAGAGATA
661 TAGCAACATA GAGGAGGATG AAGAGGCACA ACGTTTCAGA AAGGCATTTA AGGGCATCAT
721 GTTTGTTGTA GGGCAAATTG TTTTATATGA CGCAATTCCA TTCCCATTGT TCAAATACTT
781 TGATTTCCAA GGTCAATATAC AATTGATGAA CAAAATTTAT AAAGACTTAG ATTCTATTCT
841 TCAAGGATGG TTGGATGATC ATATGATGAA CAAGGATGTA AACAATAAGG ATCAAGATGC
901 CATAGATGCC ATGCTTAAGG TAACACAAC TAATGAATTC AAAGCCTATG GTTTTCTCA
961 GGCCACTGTG ATCAAGTCGA CAGTCTTGAG TTTGATCTTA GATGGAAATG ACACAACCGC
1021 TGTTCAATTTG ATATGGGTAA TGTCTTATT ACTGAACAAT CCACATGTTA TGAAACAAGG
1081 CCAAGAAGAG ATAGACATGA AAGTGGGTAA AGAGAGGTGG ATTGAAGATA CTGACATAAA
1141 AAATTTAGTG TACCTTCAGG CTATCGTTAA AGAGACATTG CGCTTGATC CACCTGTTCC
1201 TTTTCTTTTA CCACACGAAG CAGTGCAAGA TTGTAAAGTG ACTGGTTACC ACATTCCTAA
1261 AGGTACTCGT CTATATATCA ATGCGTGGAA AGTACATCGC GATTCTGAAA TTTGGTCAGA
1321 GCCCGAAAAG TTTATGCCCA ATAGATTCTT GACTAGCAA GCAAATATAG ATGCTCGCGG
1381 TCAAAATTTT GAATTTATAC CGTTTGGTTC TGGGAGACGG TCATGTCCAG GGTAGGTTT
1441 TGCGACTTTA GTGACACATC TGACTTTTGG TCGCTTGCTT CAAGGTTTTG ATTTTAGTAA
1501 GCCATCAAAC ACGCCAATTG ACATGACAGA AGGCGTAGGC GTTACTTTGC CTAAGGTTAA
1561 TCAAGTTGAA GTTCTAATTA CCCCTCGTTT ACCTTCTAAG CTTTATTTAT TTTGAAAGTG
1621 CAAATCATCA ATCATGGGTT GAGTAATTAG TGATACT

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SEQ. ID. NO. 270

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1 MDYHISFHFQ ALLGLLAFVF LSIILWRRTL TSRKLAPEIP GAWPIIGHLR QLSGTDKNIP
61 FPRILGALAD KYGPVFTLRI GMPYLVIVN WEAAKDCLTT HDKDFARPT SMAGESIGYK
121 YARFTYANFG PYYNQVRKLA LQHVLSSTKL EKMKHIVSE LETSIKELYS LTLGKNMOMK
181 VNISKWFEQL TLNIIVK TIC GKRYSNIEED EEAQRFRKAF KGIMFVVGQI VLYDAIPFPL
241 FKYFDFQGHI QLMNKIYKDL DSILQGWLDD HMMNKDVINK DQDAIDAMLK VTQLNEFKAY
301 GFSQATVIKS TVLSLILDGN DTTAVHLI WV MSLLLNPNHV MKQGQEEIDM KVGKERWIED
361 TDIKNLVYLO AIVKETLRLY PPVPFLLPHE AVQDCKVTGY HIPKGTRLYI NAWKVHRDSE
421 IWSEPEKFMP NRFLTSKANI DARGQNF EFI PFGSGRRSCP GLGFATLVTH LTFGRLLQGF
481 DFSKPSNTPI DMTEGVGVTL PKVNQVEVLI TPRLPSKLYL F

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NAME D283-AC1  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 271

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1 AGAGAGTGAA AATGGACGCA CTACTTCAAA TGACAGTAAC AGCATCTTGT GCTGCCATAG
61 TAATTACTCT GCTGGTGTGT ATATGGAGAG TGCTGAACTG GATTTGGTTC AGACCAAAGA
121 AATTGGAGTT GTTGTGAGA AAACAAGGTT TGGAAGGAAA TTCTTACAAG GTTTTGTATG
181 GGGACATGAA AGAGTTTCT GGGATGATTA AGGAAGCATA CTCAAAAGCCT ATGAGTCTAT
241 CTGATGATGT AGCACCAAGA CTGATGCCTT TCTTCTTGA AACCATCAAA AAATATGGAA
301 AAAGATCCTT TATATGGTTT GGTCCAAGAC CACTAGTATT GATTATGGAT CCTGAGCTTA
361 TAAAGGAAGT ACTCTCAAAA ATCCATCTGT ATCAAAAGCC- TGGTGGAAAT CCATTAGCAA
421 CACTATTGGT ACAAGGAATA GCAACCTATG AGGAAGACAA ATGGGCCAAA CATAGAAAAA
481 TCATCAATCC CGCTTCCAT CTAGAGAAGC TAAAGCTTAT GCTTCCAGCA TTTGCTTAA
541 GCTGTAGTGA GATGCTGAGC AAATGGGAAG ACATTGTTTC AGCTGATAGC TCACATGAGA
601 TAGATGTATG GTCTCACCTT GAGCAATTGA CTTGCGATGT GATCTCTCGG ACAGCTTTTG
661 GCAGTAGTTA TGAAGAAGGT AGAAAGATTT TTGAACTTCA AAAGGAACAA GCTCAGTATC
721 TTGTGGAAGT TTTCCGCTCC GTTATATACC CAGGAAGGAG ATTTTGGCCA ACAAGAGGA
781 ATAGAAGAAT GAAGGAAATA AAAAAAGGATG TCCGGGCATC AATTAAAGGT ATTATTGATA
841 AAAGATTGAA GGCAATGAAA GCAGGGGACA CCAATAATGA GGATCTATTG GGTATATTAC
901 TGAATCGaA TATTAAAGAA ATTGAACAGC ACGGAAACAA GGATTTTGGG ATGAGCATTG
961 AAGAAGTCAT TGAAGAATGC AAGTTATTCT ATTTTGCTGG CCAAGAAACT ACATCAGTGT
1021 TACTCCTATG GTCTCTAGTG TTGTTGAGCA GGTATCAAGA TTGGCAGGCA CGGGCCAGAG
1081 AAGAAATCTT GCAAGTCTTT GGCAGTCGAA AACAGATTT TGACGGATTA AATCATCTAA
1141 AAATTGTGAC AATGATCTTG TACGAGTCTT TAAGGCTGTA TCCCTCACTA ATAACACTTA
1201 CCCGCCGGTG TAATGAAGAC ATTGTATTAG GAGAACTATC TCTACCAGCT GGTGTTCTAG
1261 TCTCTTTGCC ATTGATTTTG TTGCATCATG ATGAAGAGAT ATGGGGTGAA GATGCAAAGG
1321 AGTTCAAACC AGAGAGATTT AGAGAAGGAA TATCAAGTGC AACAAAGGGT CAACTCACAT
1381 ATTTTCCATT TAGCTGGGGT CCTAGAATAT GTATTGGACA AAATTTTGCC ATGTTAGAAG
1441 CAAAGATGGC TCTGTCTATG ATCCTGCAAC GCTTCTCTTT TGAAGTGTCT CCGTCTTATG
1501 CACATGCCCC TCGGTCCATA ATAACGTTT AGCCTCAGTA TGGTGCTCCA CTTATTTTCC
1561 ACAAACATA ATTTTGGTAC TTCTACTAAT ATTTTAGGGT TTATTCAGAC TCAAAAAAAA

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SEQ. ID. NO. 272

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1 MTVTASCAAI VITLLVCIWR VLNWIWFRPK KLELLLRKQG LEGNSYKVLY GDMKEFSGMI
61 KEAYSKPMSL SDDVAPRLMP FFLETIKKYG KRSFIWFGPR PLVLIMDPOL IKEVLSKIHL
121 YQKPGGNPLA TLLVQGIATY EEDKWAKHRK IINPAFHLEK LKMLPAFRL SCSEMLSKWE
181 DIVSADSSHE IDVWSHLEQL TCDVISRTAF GSSYEGRKI FELQKEQAQY LVEVFRSVYI
241 PGRRFLPTKR NRRMKEIKKD VRASIKGIID KRLKAMKAGD TNNEDLLGIL LESNIKEIEQ
301 HGKNDFGMSI EEVIEECKLF YFAGQETTSV LLLWSLVLLS RYQDWQARAR EEILQVFGSR
361 KPDEFGLNHL KIVTMILYES LRLYPSLITL TRRCNEDIVL GELSPLAGVL VSLPLILLHH
421 DEEIWGEDAK EFKPERFREG ISSATKGQLT YFPFSWGPRI CIGQNFAMLE AKMALSMILQ
481 RFSFELSPSY AHAPRSIITV QPQYGAPLIF HKL

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NAME D244-AB6  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 273

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1 TGCAATATAG TTTTCCTAGT CAGTCTTAGC CTCCTTTTCC TTAGAAATAA TGGATTATCA
61 TATTTCTTTC CATTTTCAAG CTCTTTTAGG GCTTTTAGCC TTTGTGTTCT TGTCTATTAT
121 CTTATGGAGA AGAACACTCA CTTCAAGAAA ATTAGCCCCT GAAATCCCAG GGGCATGGCC
181 TATTATAGGC CATCTTCGTC AGCTGAGTGG TACTGATAAG AATATCCCAT TTCCCCGAAT
241 ATTGGGCGCT TTGGCAGATA AATATGGACC TGTCTTCACA CTGAGAATAG GGATGTACCC
301 CTATTTGATT GTCAACAATT GGAAGCAGC TAAGGATTGT CTCACAACGC ATGATAAGGA
361 CTTggCTGCC CGACCAACTT CTATGGCTGG TGAAAGCATC GGGTACAAGT ATGCGAGGTT
421 TACTTATGCT AATTTTGGTC CTTATTATAA CCAAGTGCGC AAAC TAGCCC TACAACATGT
481 ACTCTCGAGT ACTAACTCG AGAAAATGAA ACACATACGT GTTCTGAAT TGGAACTAG
541 CATCAAAGAA TTATATTCTT TGACGCTGGG CAAAAACAAC ATGCAAAAAG TGAATATAAG
601 TAAATGGTTT GAACAATTGA CTTTAAACAT AATCGTGAAG ACAATTTGTG GCAAGAGATA
661 TAGCAACATA GAGGAGGATG AAGAGGCACA ACGTTTCAGA AAGGCATTTA AGGGCATCAT
721 GTTTGTTGTA GGGCAAATTG TTTTATATGA CGCAATTCCA TTCCCATTGT TCAAATACTT
781 TGATTTCCAA GGTCATATAC AATTGATGAA CAAAATTTAT AAAGACTTAG ATTCTATTCT
841 TCAAGGATGG TTGGATGATC ATATGATGAA CAAGGATGTA AACAATAAGG ATCAAGATGC
901 CATAGATGCC ATGCTTAAGG TAACACAAC TAATGAATC AAAGCCTATG GTTTTTCTCA
961 GGCCACTGTG ATCAAGTCGA CAGTCTTGAG TTTGATCTTA GATGGAAATG ACACAACCGC
1021 TGTTCAATTG ATATGGGTAA TGTCCTTATT ACTGAACAAT CCACATGTTA TGAAACAAGG
1081 CCAAGAAGAG ATAGACATGA AAGTGGGTAA AGAGAGGTGG ATTGAAGATA CTGACATAAA
1141 AAATTTAGTG TACCTTCAGG CTATCGTTAA AGAGACATTG CGCTTGATC ACCTGTTCC
1201 TTTTCTTTTA CCACACGAAG CAGTGCAAGA TTGTAAAGTG ACTGGTTACC ACATTCTTAA
1261 AGGTACTCGT CTATATATCA ATGCGTGGAA AGTACATCGC GATCCTGAAA TTTGGTCAGA
1321 GCCCGAAAAG TTTATGCCCA ATAGATTCTT GACTAGCAA GCAAATATAG ATGCTCGCGG
1381 TCAAAATTTT GAATTTATAC CGTTTGGTTC TGGGAGACGG TCATGTCCAG GGATAGGTTT
1441 TGCGACTTTA GTGACACATC TGACTTTGG TCGCTTGCTT CAAGGTTTTG ATTTTAGTAA
1501 GCCATCAAAC ACGCCAATTG ACATGACAGA AGGCGTAGGC GTTACTTTGC CTAAGGTTAA
1561 TCAAGTTGAA GTTCTAATTA CCCCTCGTTT ACCTTCTAAG CTTTATTTAT TTTGAAGGTG
1621 CAAATCATCA ATCATGGCTT GAGTAATTAG TTATACTTTA ATATGTTTCT C

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SEQ. ID. NO. 274

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1 MDYHISFHFQ ALLGLLAFVF LSIILWRRTL TSRKLAPEIP GAWPIIGHLR QLSGTDKNIP
61 FPRILGALAD KYGPVFTLRI GMPYLVIVNN WEAAKDCLTT HDKDLAARPT SMAGESIGYK
121 YARFTYANFG PYYNQVRKLA LQHVLSSTKL EKMKHIRVSE LETSIKELYS LTLGKNMOMK
181 VNISKWFEQL TLNIIIVKTIC GKRYSNIEED EEAQRFRKAF KGIMFVVGQI VLYDAIPFPL
241 PKYFDFQGHI QLMNKIYKDL DSILQGWLDD HMMNKDVNNK DQDAIDAMLK VTQLNEFKAY
301 GFSQATVIKS TVLSLILDGN DTTAVHLIUV MSLLLNPNHV MKQGQEEIDM KVGKERWIED
361 TDIKNLVYLQ AIVKETLRLY PPVPFLLPHE AVQDCKVTGY HIPKGTRLYI NAWKVHRDPE
421 IWSEPEKFMP NRFLTISKANI DARGQNFEEI PFGSGRRSCP GIGFATLVTH LTFGRLLQGF
481 DFSKPSNTPi DMTEGVGVTL PKVNQVEVLI TPRLP SKLYL F

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NAME D205-BE9  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 275

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1 TTTGATTCAA CCATGGAGAA CCAATACTCC TACTCATTCT CTTCCTACTT CTACTTAGCT
61 ATAGTACTGT TTCTTCTTCC AATTTTGGTC AAATATTTCT TCCATCGGAG AAGAAATTTA
121 CCTCCAAGTC CATTTTCTCT TCCAATAATT GGTCACTTCT ACCTTCTCAA GAAAACCTCTC
181 CATCTCACTC TAACATCCTT ATCAGCTAAA TATGGTCCTG TTTTATACCT CAAATTGGGC
241 TCTATGCCTG TGATTGTTGT GTCCTCACCA TCTGCTGTTG AAGAATGTTT AACCAAGAAT
301 GATATCATAT TCGCAAATAG GCCCAAGACC GTGGCTGGTG ACAAGTTTAC CTACAATTAT
361 ACTGTTTATG TTTGGGCACC CTATGGCCAA CTTTGGAGAA TTCTTCGCCG ATTAACCTGTC
421 GTTGAACCTC TCTCTTCACA TAGCCTACAG AAAACTTCTA TCCTTAGAGA TCAAGAAGTT
481 GCAATATTTA TCCGTTTCGT ATACAAATTC TCAAAGGATA GTAGCAAAAA AGTCGATTGT
541 ACCAACTGGT CTTTTACTTT GGTTTTCAAT CTTATGACCA AAATTATTGC TGGGAGACAT
601 ATTGTGAAGG AGGAAGATGC TGGCAAGGAA AAGGGCATTG AAATTATTGA AAAACTTAGA
661 GGGACTTTCT TAGTAACCTC ATCATCTCTG AATATGTGTG ATTTCTTGCC AGTATTCAGG
721 TGGGTTGGTT ACAAAGGGCA GGAGAAGAAG ATGGCCTCAA TTCACAATGAA
781 TTCTTGAACA GCTTGCTTGA TGAATTTTCA CACAAGAAAA GTAGTGCTTC ACAATCTAAC
841 ACAACTGTTG GAAACATGGA GAAGAAAAACC AACTGATTG AAAAGCTCTT GTCTCTTCAA
901 GAATCAGAGC CTGAATTCTA CACTGATGAT ATCATCAAAA GTATTATGCT GGTAGTTTTT
961 GTTGCAGGAA CAGAGACCTC ATCAACAACC ATCCAATGGG TAATGAGGCT TCTTGTAGCT
1021 CACCCTGAGG CATTGTATAA GCTACGAGCT GACATTGACA GTAAAGTTGG GAATAAGCGC
1081 TTGCTGAATG AATCAGACCT CAACAAGCTT CCGTATTTGC ATTGTGTTGT ATTGAGACA
1141 ATGAGATTAT ACACTCCGAT ACCACTTTTA TTGCCTCATT ATTCAACTAA AGATTGTATT
1201 GTGGAAGGAT ATGATGTACC AAAACATACA ATGTTGTTTG TCAACGCTTG GGCCATTCAC
1261 AGGGATCCCA AGGTATGGGA GGAGCCTGAC AAGTTCAAGC CAGAGAGATT TGAGGCAACA
1321 GAAGGGGAAA CAGAAAGGTT CAATTACAAG CTTGTACCAT TTGGAATGGG GAGAAGAGCG
1381 TGCCCTGGAG CTGATATGGG GTTGCGAGCA GTTTCTTTGG CATTAGGTGC ACTTATTCAA
1441 TGCTTTGACT GGCAAATTGA GGAAGCGGAA AGCTTGAGG AAAGCTATAA TTCTAGAATG
1501 ACTATGCAGA ACAAGCCTTT GAAGGTTGTC TGCCTCCAC GCGAAGATCT TGGCCAGCTT
1561 CTATCCCAAC TCTAAGGCAA TTTATCAATG CCAAACGTAA TCTTCATCTA CCACTATG

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SEQ. ID. NO. 276

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1 MENQSYSFS SYFYLAIVLF LLPILVKYFF HRRRNLPSP FSLPIIGHLY LLKKTLHLTL
61 TSLSAKYGPV LYLKLGMPV IVVSSPSAVE ECLTKNDIIF ANRPKTVAGD KFTYNYTVYV
121 WAPYQLWRI LRRLTVVELF SSHSLQKTSI LRDQEVAFI RSLYKFSKDS SKKVDLTNWS
181 FTLVFNLMK IIAGRHIKE EDAGKEKGIE IIEKLRGTFL VTTSFLNMCD FLPVFRWVG
241 KGQEKMASI HNRNEFLNS LLDEFHKKK SASQSNTTVG NMEKKTTLIE KLLSLQSESE
301 EFYTDDIIS IMLVVVFAGT ETSSTTIQWV MRLLVAHPEA LYKLRLADIDS KVGKRLNE
361 SDLNKLPYLH CVVNETMRLY TPIPLLLPHY STKDCIVEGY DVPKHTMLFV NAWAIHRDPK
421 VWEPPDKFKP ERFEATEGET ERFNYKLVFP GMGRRACPGA DMGLRAVSLA LGALIQCFDW
481 QIEEAESLEE SYNRMRTMQN KPLKVVCTPR EDLGQLLSQL

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NAME D136-AF4  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 277

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1 CCTTTTAAAG ATGTATTTAA GATTTAAGAT TTAAGATGAA GCAACTGAGG TAAGTCCTTT
61 CAAGGAGTAG TTGTCACTTC TGAGAATGGA GATGATGTAC AGCATAATAG CAGCAGCCAG
121 TATTGCAATT ATCTTGGTAT ATACATGGAA AGTGTGTAAT TGGGCTTGGT TTGGGCCGAA
181 GAAAATGGAG AAATGCTTAA GACAGAGGGG TCTCAAGGGA AATCCTTATA AGCTACTCTA
241 TGGAGATCTA AACGAACTGA CAAAAAGCAT AATAGAAGCC AAGTCTAAGC CCATCAATTT
301 CTCTGATGAT ATTGCTCAAA GGCTCATCCC TTTTTTCTT GACGCCATCA ACAAAAATGG
361 TAAAAACTCC TTCGTCTGGC TTGGACCGTA TCCAATAGTG TTGATCACGG ATCCTGAGCA
421 TTTAAAGGAG ATTTTCACAA AGAATTATGT GTATCAAAAG CAAACTCATC CCAATCCATA
481 CGCCAAGCTA TTAGCTCACG GTCTTGTCAG CCTTGAGGAA GACAAATGGG CCAAACACAG
541 AAAAATCATT AGTCCTGCCT TCCATGTCGA GAAGCTAAAG CATATGCTGC CTGCATTTTA
601 TCTGAGTTGT AGTGAAATGA TAAGCAAATG GGAGGAGGTT GTTCCAAAAG AAACATCATT
661 CGAGCTCGAT GTATGGCCAG ACCTTCAAAT AATGACCAGT GAAGTCATTT CTCGCACATG
721 ATTTGGGAGT AGCTATGAAG AAGGAAGAAT AGTATTTGAA CTTCAGAAAAG AACAAAGCTGA
781 GTATGTAATG GACATAGGAC GTTCAATTTA TATACCAGGA TCAAGGTTCT TGCCTACTAA
841 AAGGAACAAA AGAATGCTGG AAATTGAAAA GCAAGTGCAA ACAACAATTA GCGGTATCAT
901 CGACAAAAGA TTGAAGGCAA TGGAAGAAGG GGAGACTAGT AAAGATGACT TATTAGGCAT
961 ATTACTTGAA TCCAATTTGA AAGAAATTGA ACTTCATGGA AGAAATGACT TGGGAATAAC
1021 AACGTCAGAA GTGATTGAAG AGTGCAAGTT ATTCTATTTT GCCGGCCAAG AGACCACTTC
1081 AGTGTGCTT GTTTGGACAA TGATTTTGTT GTGCTTACAT CCAGAGTGGC AAGTACGTGC
1141 CAGAAAGGAA GTGTTGCAGA TCTTTGGAAA TGATAAACCA GATTTGGAAG GACTAAGTCG
1201 CTTGAAAATT GTAACAATGA TCTTGACGA GACGTTACGC CTATTCCCCC CATTACCAGC
1261 ATTTGGTAGA AGGAACAAAG AAGAAGTCAA ATTAGGGGAG CTACATCTAC CGGCTGGAGT
1321 GTTACTCGTT ATACCAGCAA TCTTAGTACA TTATGATAAG GAAATATGGG GTGAAGATGC
1381 AAAGGAATTC AAACCAGAAA GATTCACTGA AGGAGTGTC AAGGCAACAA ATGGACAAGT
1441 CTCATTTATA CCATTTAGCT GGGGACCTCG TGTGTCATT GGACAAAAC TCGCAATGAT
1501 GGAAGCAAAA ATGGCAGTAA CTATGATACT ACAAAAATTC TCCTTTGAAC TATCCCCTTC
1561 TTATACACAT GCTCCATTTG CAATTGTGAC TATTCATCCC CAGTATGGTG CTCCTCTGCT
1621 TATGCGCAGA CTTTAAACA TATGTTGCTG ATATTTAAGA TCAGTGGCGT TTTATT

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SEQ. ID. NO. 278

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1 MEMMYSIIAA ASIAILVYT WKVLNNAWFG PKKMEKCLRQ RGLKGNFYKL LYGDLNELTK
61 SIIEAKSKPI NFSDDIAQRL IPFFLDIAINK NGKNSFVWLG PYPIVLITDP EHLKEIFTKN
121 YVYQKQTHPN PYAKLLAHGL VSLEEDKWAK HRKIIISPAFH VEKLKHLMLPA FYLSCSEMIS
181 KWEEVVPKET SFELDVWPD L QIMTSEVISR TAFGSSYEEG RIVFELQKEQ AEYVMDIGRS
241 IYIPGSRFLP TKRNRMLLEI EKQVQTTIRR IIDKRLKAME EGETSKDDL GILLESNLKE
301 IELHGRNDLG ITTSEVIEEC KLFYFAGQET TSVLLVWTMI LLCLHPEWQV RARKEVLQIF
361 GNDKPDLEGL SRLKIVTMIL YETLRLFPPL PAFGRNKEE VKLGELHLPA GVLLVIPAIL
421 VHYDKIEWGE DAKEFKPERF SEGVSKATNG QVSFIPFSWG PRVCIGQNFA MMEAKMAVTM
481 ILQKFSFELS PSYTHAPFAI VTIHPQYGAP LLMRRL

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NAME D101-BA2  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 279

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1 CTAAATTTCA TATACCTTTA GTACTCTTGA AATTTTCAAA TAATGGTTTA TCTTCTTTCT
61 CCCATAGAAG CCATTGTAGG ATTTGTAACC TTTTCATTTT TATTCTACTT TCTATGGACC
121 AAAAAACAAT CAAAAATCTT AAACCCACTA CCTCCAAAAA TCCCAGGTGG ATGGCCAGTA
181 ATCGGCCATC TCTTTTATTT CAAGAACAAT GGCGATGAAG ATCGCCATTT TTCTCAAAAA
241 CTCGGTGACT TAGCTGACAA ATATGGTCCC GTCTTCACTT TCCGGTTAGG GTTTCGCCGT
301 TTCTTGGCGG TGAGTAGTTA TGAAGCTATG AAAGAATGCT TCACTACCAA TGATATCCAT
361 TTCGCCGATC GGCCATCTTT ACTCTACGGA GAATACCTTT GCTATAATAA TGCCATGCTT
421 GCTGTTGCCA AATATGGCCC TTACTGGAAA AAAAATCGAA AGTTAGTCAA TCAAGAAGTT
481 CTCTCCGTTA GTCGGCTCGA AAAATTCAAA CATGTTAGAT TTTCTATAAT TCAGAAAAAT
541 ATTAAACAAT TGTATAATTG TGATTCACCA ATGGTGAAGA TAAACCTTAG TGATTGGATA
601 GATAAATTGA CATTCGACAT CATTTTGAAA ATGGTTGTTG GGAAGAACTA TAATAATGGA
661 CATGGAGAAA TACTCAAAGT TGCTTTTCAG AAATTCATGG TTCAAAGCTAT GGAGATGGAG
721 CTCTATGATG TTTTTCACAT TCCATTTTTC AAGTGGTTGG ATCTTACAGG GAATATTAAG
781 GCTATGAAAC AAACTTTCAA AGACATTGAT AATATTATCC AAGGTTGGTT AGATGAGCAC
841 ATTAAGAAGA GAGAAACAAA GGATGTTGGA GGTGAAAACG AACAAAGATT TATAGATGTG
901 GTGCTTTCCA AGATGAGCGA CGAACATCTT GGCGAGGGTT ACTCTCATGA CACAACCATC
961 AAAGCAACTG TATTCACTTT GGTCTTGGAT GCAACAGACA CACTTGCAC TCAATAAAG
1021 TGGGTAATGG CGTTAATGAT AAACAATAAG CATGTCATGA AGAAAAGCACA AGAAGAGATG
1081 GACACAATTG TTGGTAGAGA TAGATGGGTA GAAGAGAGTG ATATCAAGAA TTTGGTGTAT
1141 CTCCAAGCAA TTGTTAAAGA AGTATTACGA TTACATCCAC CTGCACCTTT GTCAGTGCAA
1201 CACCTATCTG TGGAAGATTG TGTTGTCAAT GGGTACCATA TTCCTAAGGG GACTGCACTA
1261 CTTACCAATA TTATGAAACT ACAGCGAGAT CCTCAAACAT GGCCAAATCC TGATAAATTC
1321 GATCCAGAGA GATTCCTGAC GACTCATGCT ACTATTGACT ACCGCGGGCA GCACTATGAG
1381 TTGATCCCTT TTGGTACGGG GAGACGAGCT TGTCCCGCGA TGAATTATTC ATTGCAAGTG
1441 GAACACCTTT CAATTGCTCA TATGATCCAA GGTTCAGTT TTGCAACTAC GACCAATGAG
1501 CCTTTGGATA TGAAACAAGG TGTGGGTTTA ACTTTACCAA AGAAGACTGA TGTTGAAGTT
1561 CTAATTACCC CTCGTTT

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SEQ. ID. NO. 280

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1 MVYLLSPIEA IVGFVTFSL FYFLWTKKQS KILNPLPPKI PGGWPVIGHL FYFKNNGDED
61 RHFSQKLGLD ADKYGPVFTF RLGFRRFLAV SSYEAMKECF TTNDIHFADR PSLLYGEYLC
121 YNNAMLAVAK YGPYWKKNRK LVNQEVLVS RLEKFKHVRF SIIQKNIKQL YNCDSPMVKI
181 NLSDWIDKLT FDIILKMVVG KNYNNGHGEI LKVAFAQFMV QAMEMELYDV FHIPFFKWLD
241 LTGNIKAMKQ TFKDIDNIIQ GWLDEHIKKR ETKDVGGENE QDFIDVVL SK MSDEHLGEGY
301 SHDTTIKATV FTLVLDATDT LALHIKWMMA LMINNKHVMK KAEEMDTIV GRDRWVEESD
361 IKNLVYLQAI VKEVLR LHPP APLSVQHLSV EDCVVNGYHI PKGTALLTNI MKLQRDPQTW
421 PNPDKFDPER FLTTHATIDY RGQHYELIPF GTGRRACPA M NYSLQVEHLS IA HMIQGF SF
481 ATTTNEPLDM KQGVGLTL PK KTDVEVLITP R

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NAME D130-AA1  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 281

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1 CTTTTTCTCC CCAAAAAAGA GCTCATTTCC CTTGTCCCA AAAATGGATC TTCTCTTACT
61 AGAGAAGACC TTAATTGGTC TCTTCTTTGC CATTTTAATC GCTGTAATTG TCTCTAGACT
121 TCGTTCAAAG CGTTTAAAGC TCCCCCAGG ACCAATCCCA GTACCAGTTT TTGGTAATTG
181 GCTTCAAAGT GGTGATGATT TAAACCACAG AAATCTTACT GATTTTGCCA AAAAATTTGG
241 TGATCTTTTC TTGTTAAGAA TGGGCCAGCG TAATTTAGTT GTTGTGTCAT CTCCTGAATT
301 AGCTAAAGAA GTTTTACACA CACAAGGTGT TGAATTTGGT TCAAGAACAA GAAATGTTGT
361 ATTTGATATT TTTACTGGAA AAGGTCAAGA TATGGTTTTT ACTGTATATG GTGAACACTG
421 GAGAAAAATG AGGAGAATTA TGACTGTACC ATTTTTTACT AATAAAGTTG TGCAGCAATA
481 TAGAGGGGGG TGGGAGTTTG AAGTGGCAAG TGTAATTGAG GATGTGAAGA AAAATCCTGA
541 ATCTGCTACT AATGGGATTG TATNAAGGAG GAGATTACAA TTGATGATGT ATAATAATAT
601 GTTTAGGATT ATGTTTGATA GGAGATTGTA GAGTGAAGAT GATCCTTTGT TTGTTAAGCT
661 TAAGGCTTTG AATGGTGAAA GGAGTAGATT GGCTCAGAGT TTTGAGTATA ATTATGGTGA
721 TTTTATTCCC ATTTTGAGGC CTTTTTTGAG AGGTTATTTG AAGATCTGTA AAGAAGTTAA
781 GGAGAAGAGG CTGCAGCTTT TCAAAGATTA CTTTGTGAT GAAAGAAAGA AGCTTTCAAA
841 TACCAAGAGC TTGGACAGCA ATGCTCTGAA ATGTGCGATT GATCACATTC TTGAGGCTCA
901 ACAGAAGGGG GAGATCAATG AGGACAACGT TCTTTACATT GTTGAAAACA TCAATGTTGC
961 TGCTATAGAA ACCACATTAT GGTCAATTGA GTGGGGTATC GCCGAGTTAG TCAACCACCC
1021 TCACATCCAA AAGAACTCC GCGACGAGAT TGACACAGTT CTTGGCCCAG GAGTGCAAGT
1081 GACTGAACCA GACACCCACA AGCTTCCATA CCTTCAGGCT GTGATCAAGG AGACGCTTCG
1141 TCTCCGTATG GCAATTCCTC TATTAGTCCC ACACATGAAC CTTACGATG CAAAGCTTGG
1201 CGGGTTTGAT ATTCCAGCAG AGAGCAAAAT CTTGGTTAAC GCTTGGTGGC TAGCTAACAA
1261 CCCGGCTCAT TGGAAGAAAC CCGAAGAGTT CAGACCCGAG AGGTTCTTCG AAGAGGAGAA
1321 GCACGTTGAG GCCAATGGCA ATGACTTCAG ATATCTTCCG TTTGGCGTTG GTAGGAGGAG
1381 TTGCCCTGGA ACTATACTTG CATTGCCAAT TCTTGGCATT ACTTTGGGAC GTTT

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SEQ. ID. NO. 282

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1 MDLLLLLEKTL IGLFFAILIA VIVSRLRSKR FKLPPGPIPV PVFGNWLQVG DDLNHRNLTD
61 FAKKFGDLFL LRMGQRNLVV VSSPELAKEV LHTQGVFEFS RTRNVVFDIF TGKGQDMVFT
121 VYGEHWRKMR RIMTVFFFTN KVVQYRGGW EFEVASVIED VKKNPESATN GIVLRRRLQL
181 MMYNNMFRIM FDRRFESEDD PLFVKLKALN GERSRLAQSF EYNYGDFIPI LRPFLRGYLK
241 ICEVKEKRL QLFKDYFVDE RKKLSNTKSL DSNALKCAID HILEAQQKGE INEDNVLYIV
301 ENINVAAIET TLWSIEWGIA ELVNHPHIQK KLRDEIDTVL GPGVQVTEPD THKLPYLQAV
361 IKETLRLRMA IPLLVPHMNL HDAKLGFDI PAESKILVNA WWLANNPAHW KKPEEFRPER
421 FFEEKHVEA NGNDFRYLPF GVGRRSCP GT ILALPILGIT LGR

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NAME D136-AD5  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 283

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1 CCAAATTAGA GCAAGAAATT AACAAGTCTA GTTACCTTCT CCCTTTTAA GAGTATTTAA
61 GATTTAAGAT TTAAGATGAA GCAACTGAGG TAAGTCCTTT CAAGGAGTAG TTGTCACCTC
121 TGAGAATGGA GATGATGTAC AGCATAATAG CAGCAGCCAG TATTGCAATT ATCTTGGTAT
181 ATACATGGAA AGTGTGAAT TGGGCTTGGT TTGGGCCAAA GAAAATGGAG AAATGCTTAA
241 GACAGAGGGG TCTCAAGGGA AATCCTTATA AGCTACTCTA TGGAGATCTA AACGAAGTGA
301 CAAAAAGCAT AATAGAAGCC AAGTCTAAGC CCATCAATTT CTCTGATGAT ATTGCTCAAA
361 GGCTCATCCC TTTTTTCTT GACGCCATCA ACAAAAATGG TAAAAACTCC TTCGTCTGGC
421 TTGGACCGTA TCCAATAGTG TTGATCACGG ATCCTGAGCA TTTAAAGGAG ATTTTCACAA
481 AGAATTATGT GTATCAAAAG CAACTCATC CCAATCCATA CGCCAAGCTA TTAGCTCACG
541 GTCTTGTCAG CCTTGAGGAA GACAAATGGG CCAAAACACAG AAAAAATCATT AGTCCTGCCT
601 TCCATGTCGA GAAGCTAAAG CATATGCTGC CTGCATTTTA TCTGAGTTGT AGTGAAATGA
661 TAAGCAAAATG GGAGGAGGTT GTTCCAAAAG AAACATCATT CGAGCTCGAT GTATGGCCAG
721 ACCTTCAAAAT AATGACCAGT GAAGTCATTT CTCGCACTGC ATTTGGGAGT AGCTATGAAG
781 AAGGAAGAAT AGTATTTGAA CTTCAGAAAG AACAAAGCTGA GTATGTAATG GACATAGGAC
841 GTTCAATTTA TATACCAGGA TCAAGGTTCT TGCCTACTAA AAGGAACAAA AGAATGCTGG
901 AAATTGAAAA GCAAGTGCAA ACAACAATTA GGCCTATCAT CGACAAAAGA TTGAAGGCAA
961 TGGAAAGAAGG GGAGACTAGT AAAGATGACT TATTAGGCAT ATTACTTGAA TCCAATTTGA
1021 AAGAAATTGA ACTTCATGGA AGAAATGACT TGGGAATAAC AACATCAGAA GTGATTGAAG
1081 AGTGCAAGTT AATCTATTTT GCCGGCCAAG AGACCACTTC AGTGTGCTT GTTTGGACAA
1141 TGATTTTGTT GTGCTTACAT CCAGAGTGGC AAGTACGTGC CAGAAAGGAA GTGTTGCAGA
1201 CCTTTGAAA TGATAAACCA GATTTGGAAG GACTAAGTCG CTTGAAAATT GTAACAATGA
1261 TCTTGACGA GACGTTACGC CTATTCCTCC CATTACCAGC ATTTGGTAGA AGGAACAAAG
1321 AAGAAGTCAA ATTAGGGGAG CTACATCTAC CGGCTGGAGT GTTACTCGTT ATACCAGCAA
1381 TCTTAGTACA TTATGATAAG GAAATATGGG GTGAAGATGC AAAGGAATTC AAACCAGAAA
1441 GATTCAAGTGA AGGAGTGTCA AAGGCAACAA ATGGACAAGT CTCATTTATA CCATTTAGCT
1501 AGGGACCTCG TGTTTGCAAT GGACAAAAC TCGCAATGAT GGAAGCAAAA ATGGCAGTAA
1561 CTATGATACT ACAAAAATTC TCCTTTGAAC TATCCCCTTC TTATACACAT GCTCCATTTG
1621 CAATTGTGAC TATTCATCCC CAGTATGGTG CTCCTCTGCT TATGCGCAGA CTTTAAAACA
1681 TATGTTGCTG ATATTAAAGA TCAGTGGCGT TTTATTCTCC ATG

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SEQ. ID. NO. 284

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1 MEMMYSIIAA ASIAIILVYT WKVLNWAUFG PKKMEKCLRQ RGLKGNPYKL LYGDLNELTK
61 SIIEAKSKPI NFSDDIAQRL IPFFLDIAINK NGKNSFVWLG PYPIVLITDP EHLKEIFTKN
121 VVYQKQTHPN PYAKLLAHGL VSLEEDKWAK HRKIISPAFH VEKLKHLPA FYLSCSEMIS
181 KWEEVVPKET SFELDVWPD LQIMTSEVIS TAFGSSYEEG RIVFELQKEQ AEYVMDIGRS
241 IYIPGSRFLP TKRNKRMLEI EKQVQTTIRR IIDKRLKAME EGETSKDDL GILLESNLKE
301 IELHGRNDLG ITTSEVIEEC KLIYFAGQET TSVLLVWTMI LLCLHPEWQV RARKEVLQTF
361 GNDKPDLEGL SRLKIVTMIL YETLRLFPPL PAFGRNKEE VKLGELHLPA GVLLVIPAIL
421 VHYDKIEWGE DAKEFKPERF SEGVSKATNG QVSFIPFS

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NAME D138-AD12  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 285

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1 TTTGCCTTTG CTCGTCATTG ATGACGACTT CATT TTGTTT TCTTCCCCAC GAAAATGGTA
61 GATATGATAT GGAGGGACGT AGGGAAGAAT TACTGGGACA AACCTAGTGA GTGAAAATGG
121 AAACAGTTGA AATGATAGTA AAAGTATCTT GTGCTGCCAT AGTAATTACT CTGTTGGTGT
181 GTCTATGGAG AGTGCTGAAT TGGGTTTGGT TCAGACCAAA GAAATTAGAG AAGTTGTTGA
241 GAAAACAGGT TTTGTATGGG GACATGAAAG AGTTTTCTGG GATGATTAAG GAAGCATACT
301 CAAAGCCTAT GAGTCTGTCT GATGATGTAG CACCACGAAT GATGCCTTTC TTTCTTGAAA
361 CCATCAAGAA ATATGGAAAA AGATCCTTTA TATGGTTCGG TCCAAGACCA CTAGTATTGA
421 TCATGGATCC TGAGCTTATA AAGGAAGTAC TCTCCAAAAT CTATCTTTAT CAAAAGCCCCG
481 GTGGAAATCC ATTAGCAACA CTATTGGTAC AAGGATTAGC AACCTATGAG GAAGACAAAT
541 GGGCCAAACA TAGAAAAATC ATCAATCCCG CTTTCCATCT AGAGAAGCTA AAGCATATGC
601 TTCCAGCTTT TCGCTTGAGC TGTAAGTGA TGCTGAGCAA ATGGGAAGAC ATTGTTTCAG
661 CTGAAGGCTC ACATGAGATA GATGTATGGC CTAACCTTGA GCAATTGAGT TGCATGTGA
721 TCTCTCGGAC AGCTTTTGGC AATAGTTATG AAGAAGGTAG AAAGATTTT GAACCTTCAA
781 AGGAACAAAC TCAGCATCTT GTGGAAGCTT TCCGCTCTGT TTATATCCCA GGAAGGAGAT
841 TTTTGCCAAC AAAGAGGAAT AGAAGAATGA AGGAAATAAA AAAGGAGGTT CGAGCGTCAA
901 TTAAAGGTAT TATTGATAAA AGATTGAAGG CAATGAAAGC AGGGGACACC AATAATGAGG
961 ATCTATTGGG ATATTGCTGG AATCAAATTT TAAAGAAATT GAACAGCGCG GAAACAAGGA
1021 TTTTGGAATG AGCATTGAAG ATGTCATTGA AGAATGCAAG TTATTCTATT TTGCTGGCCA
1081 AGAAACTACA TCAGTGTTGC TCCTATGGTC TCTAGTGTCTG TTGAGCAGGT ATCAAGATTG
1141 GCAGACACGG GCCAGAGAAG AAGTCTTGCA TGTCTTTGGG AGTCGGAAAC CAGATTTTGA
1201 TGAATTAAAT CATCTAAAAG TTGTGACAAT GATCATGTAC GAGTCTTTAA GGCTATATCC
1261 CTCACTAATA ACACCTTACC GCCGGTGTA TGAAGACATT GTATTAGGAG AACTATCTCT
1321 ACCAGCTGGT GTCCTAGTCT CTTTGCCAAT GATTTTGTG CATCATGATG AAGAGATATG
1381 GGGTGAAGAT GCAAAGGAGT TCAAACCAGA GAGATTTAGA GAAGGATTGT CAAGTGCAAC
1441 AAAGGTCAA CTTACATATT TTCCATTGG CTGGGGTCCT AGAATATGTA TTGGACAAAA
1501 TTTTGCCATG TTAGAAGCAA AGATGGCTCT GTCTATGATC CTGCAACGCT TCTCTTTTGA
1561 ACTGTCTCCG TCTTATGCAC ATGCCCCTCA GTCCATATTA ACCGTTTCCAG CTCAATATGG
1621 TGCTCCACTT ATTTTCCACA AGCTATAATT TGGTACTTGT GAAAGGTGTC TTGTACAATA
1681 TGTTAGTAGA GTTTATTCAG ACTTAGATAC ATGCTTC

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SEQ. ID. NO. 286

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1 METVEMIVKV SCAAIVITLL VCLWRVNLNV WFRPKKLEKL LRKQVLYGDM KEFSGMIKEA
61 YSKPMSLSD VAPRMPFFL ETIKKYGKRS FIWFGPRPLV LIMDP ELIKE VLSKIYLYQK
121 PGGNPLATLL VQGLATYEED KWAKHRKIIN PAFHLEKLKH MLPAPRLSCS EMLSKWEDIV
181 SAEGSHEIDV WPNLEQLSCD VISRTAFGNS YEEGRKIFEL QKEQTQHLVE AFRSVYIPGR
241 RFLPTKRNR MKEIKKEVRA SIKGIIDKRL KAMKAGDTNN EDLLGYCWNQ ILKKLNSAET
301 RILE

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NAME D216-AG8  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 287

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1 CCAAAATGCA GTTCTTCAAC TTCATTTTCCT TTGTCTTTT TGTGTCTTTC CTCTTTTAT
61 TAAGGAAATG GAAGAACTCC AATAGCCAAA CCAAAAGATT GCCTCCAGGT CCATGGAAAT
121 TACCTGTACT TGGAAGCATG TTTCAATTGC TAGGTGGACC TCCACATCAT GTCCTTGGAG
181 ATTTAGCCAA AAAATATGGT CCACTTATGC ACCTTCAACT AGGTGAAGTT TCTGTAGTTT
241 CTGTTACTTC TCCTGAGATG GCAAAAGAAG TACTAAAAAC TCATGACCTC GCTTTTGCAT
301 CTAGGCCGTT ACTTTTGGCA GCCAAAATTG TCTGCTATAA TGGGACAGAC ATTGTCTTTT
361 CCCCCTATGG CGATTATTGG AGACAAACGC GTAAAAATTG TCTCTTGGAA TTGCTCAGTG
421 CCAAAAATGT TAGGTCATTC AGCTCAGTCA GACGAGATGA AGTTTTCAT ATGATTGAAT
481 TTTTTTCGAT CATCTTCTGG TAAGCCAGTT AATGTATCAA AAAGGATTTC TCTATTACAC
541 ACCTCTATGA CATGTAGATC AGCCTTTGGA CAAGAATACA AGGAGCAAGA CGAATTCGCA
601 CAACTAGTAA AAAAAGTGTC AAGCTTAATG GAAGGGTTTG ATGTTGCTGA TATATTCCCT
661 TCATTGAAGT TTCTTCATGT GCTCAGTGGA ATGAAGGCTA AGTTATGGA TGCACACCAT
721 GAGTTAGATG CCATTCTTGA AAAAATTATC AATGAGCACA AGAAAATTGC AACTGGAAAG
781 AATAATAATG AATTAGGAGG TGAAGGATTA ATTGACGTAC TGCTAAGACT TATGAAAGAG
841 GGAGGCCTTC AATTCCCGAT CACCAACGAC AACATCAAAG CTATTATTTT TGACATGTTT
901 GGTGCGGGAA CGGAAACTTC ATCAACCACA ATTGACTGGG CCATGGTCGA AATGATAAAG
961 AATCCAAGTG TATTCGCTAA AGCTCAAGCA GAGGTAAGAG AAGCCTTCAG AGAGAAAGAA
1021 ACTTTTGATG AAAATGATGT CGAGGAGTTG AAATACTTAA AATTGGTTAT CAAAGAAACT
1081 TTCAGACTCC ATCCTCCATT TCCCCTTTTG CTCCCAAGAG AATCTAGAGA AGAAACAGAT
1141 ATAAACGGCT AACTATTCC TTTTAAAACA AAACCTATGG TTAACGTTTC GGCTATTGGA
1201 AGAGATCCAA AATATTGGGA TGACGTGGAA AGTTTAAAGC CAGAGAGATT TGAGCACAAC
1261 TCTATGGATT TTATTGGTAA TAATTTTGAA TATCTTCCCT TTGGTAGTGG AAGGAGAATG
1321 TGCCCTGGGA TATCATTTGG TTTGGCTAAT GTTTATTTGC CACTAGCTCA ATTGTTATAT
1381 CATTTTGATT GGAAACTCCC TACTGGAATC AATTCAAGTG ACTTGACAT GACTGAGTCG
1441 TCAGGAGTAA CTTGTGCTAG AAAGAGTGAT TTATACTTGA CTGCTACTCC ATATCAACTT
1501 TCTCAAGAGT GATGCAATGA TATCAACCTT TTGAATTTTC GTCAACCCCA CCAATAGTG

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SEQ. ID. NO. 288

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1 MQFFNFISFV FFVSFLFLLR KWKNSNSQTK RLPPGPWKLP VLGSMFHLLG GPPHHVLGDL
61 AKKYGPLMHL QLGEVSVVSV TSPMAKEVL KTHDLAFASR PLLLAAKIVC YNGTDIVFSP
121 YGDYWRQTRK ICLLELLSAK NVRSFSSVRR DEVFHMIEFF SIIFW

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NAME D243-AB3  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 289

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1  CCCCACCAAA AAATCATTTTCTCTCGTCTAA AATGGATCTT CTCTTACTAG AGAAGACCTT
61 AATTGGTCTT TTCTTTGCCA TTTTAATCGC TTTAATTGTC TCTAAACTTC GTTCAAAGCG
121 TTTTAAGCTT CCTCCAGGAC CAATCCAGT ACCAGTTTTT GGTAATTGGC TTCAAGTTGG
181 TGATGATTTA AACCACAGAA ATCTTACTGA TTATGCCAAG AAATTTGGAG ATCTTTTCTT
241 GTTAAGAATG GGTCAACGTA ACTTAGTTGT TGTGTCATCT CCTGAATTAG CTAAAGAAGT
301 TTTACACACA CAAGGTGTTG AATTTGGTTC AAGAACAAGA AATGTTGTGT TTGATATTTT
361 TACTGGAAAA GGTCAAGATA TGGTTTTTAC TGTATATGGT GAACATTGGA GAAAAATGAG
421 GAGAATTATG ACTGTACCAT TTTTACTAA TAAAGTTGTG CAACAGTATA GAGGGGGGTG
481 GGAGTTTGAG GTGGCAAGTG TAATTGAGGA TGTGAAAAAA AATCCTGAAT CTGCTACTAA
541 TGGGATCGTA TTAAGGAGGA GATTACAATT AATGATGTAT AATAATATGT TTAGGATTAT
601 GTTTGATAGG AGATTTGAGA GTGAAGATGA TCCTTTGTTT GTTAAGCTTA AGGCTTTGAA
661 TGGTGAAAGG AGTAGATTGG CTCAAAGTTT TGAGTATAAT TATGGTGATT TTATTCCAAT
721 TTTGAGGCCT TTTTTGAGA GGTATTTTGA AGATCTGTAA AGAAGTTAAG GAGAAGAGGC
781 TGCAGCTTTT CAAAGATTAC TTTGTTGATG AAAGAAAGAA GCTTTCGAAT ACCAAGAGCT
841 CGGACAGCAA TGCCCTAAAA TGTGCGATTG ATCACATTCT TGAGGCTCAA CAGAAGGGAG
901 AGATCAATGA GGACAACGTT CTTTACATTG TTGAAAACAT CAATGTTGCT GCAATTGAAA
961 CAACATTATG GTCAATTGAG TGGGGTATCG CCGAGCTAGT CAACCACCCT CACATCCAAA
1021 AGAAACTGCG CGACGAGATT GACACAGTTC TTGGACCAGG AGTGCAAGTG ACTGAACCAG
1081 ACACCCACAA GCTTCCATAC CTTCAGGCTG TGATCAAGGA GGCACCTCGT CTCCGTATGG
1141 CAATTCTCTT ATTAGTCCCA CACATGAACC TTCACGACGC AAAGCTTGGC GGGTTTGATA
1201 TTCCAGCAGA GAGCAAAATC TTGGTTAACG CTTGGTGGTT AGCTAACAAC CCGGCTCATT
1261 GGAAGAAACC CGAAGAGTTC AGACCCGAGA GGTTCTTTGA AGAGGAGAAG CATGTTGAGG
1321 CCAATGGCAA TGAATTCAGA TATCTTCCGT TTGGCGTTGG TAGGAGGAGC TGCCCTGGAA
1381 TTATACTTGC ATTGCCAACT CTTGGCATCA CTTTGGGACG TTTGGTTTCA AACTTTGAGC
1441 TGTTGCCTCC TCCAGGCCAG TCGAAGCTCG ACACCACAGA GAAAGGTGGA CAGTTCAGTC
1501 TCCACATTTT GAAGCATTCC ACCATTGTGT TGAAACCAAG GTCTTTCTGA ACTTTGTGAT
1561 CTTATTAATT AAGGGGTTCT GAAGAAATTT GATAGTGTG G

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SEQ. ID. NO. 290

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1  MDLLLLLEKTL IGLFFAILIA LIVSKLRSKR FKLPPGPIPV PVFGNWLQVG DDLNHRNLTD
61 YAKKFGDLFL LRMGQRNLVV VSSPELAKEV LHTQGVFEFS RTRNVVFDIF TGKGQDMVFT
121 VYGEHWRKMR RIMTVPFFTN KVVQYRGGW EFEVASVIED VKKNPESATN GIVLRRRLQL
181 MMYNNMFRIM FDRRFESEDD PLFVKLKALN GERSRLAQSF EYNYGDFIPI LRPFFERLFE
241 DL

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NAME D205-AH4  
ORGANISM NICOTIANA TABACUM  
SEQ. ID. NO. 291

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1 GTGAGGTTTG AATCCTCTGC CTCAATGAAA CTCACCAAAT TGGTTTTCTA ATTTCCATCT
61 AAAATATTGT CCAAAGCTAA AGATTCTTTC TCCTTAAATA GTCAACTTTA GTGGTTCCTC
121 TTCATTTTCAT AGCTCAATCT TTCTTATTTT GATTCAACCA TGGAGAACCA ATACTCCTAC
181 TCATTCTCTT CCTACTTCTA CTTAGCTATA GTACTGTTTC TTCTTCCAAT TTTGGTCAAA
241 TATTTCTTCC ATCGGAGAAG AAATTTACCT CCAAGTCCAT TTTCTCTTCC AATAATTGGT
301 CACCTTTACC TTCTCAAGAA AACTCTCCAT CTCACTCTAA CATCCTTATC AGCTAAATAT
361 GGTCCTGTTT TATACCTCAA ATTGGGCTCT ATGCCTGTGA TTGTTGTGTC CTCACCATCT
421 GCTGTTGAAG AATGTTTAAC CAAGAATGAT ATCATATTCTG CAAATAGGCC CAAGACCGTG
481 GCTGGTGACA AGTTTACCTA CAATTATACT GTTTATGTTT GGGCACCTTA TGGCCAACTT
541 TGGAGAATTC TTGCGCGATT AACTGTCGTT GAACCTCTTCT CTTACACATAG CCTACAGAAA
601 ACTTCTATCC TTAGAGATCA AGAAGTTGCA ATATTTATCC GTTCGTTATA CAAATTCTCA
661 AAGGATAGTA GCAAAAAAGT CGATTTGACC AACTGGTCTT TTACTTTGGT TTTCAATCTT
721 ATGACCAAAA TTATTGCTGG GAGACATATT GTGAAGGAGG AAGATGCTGG CAAGGAAAAG
781 GGCATTGAAA TTATTGAAAA ACTTAGAGGG ACTTTCTTAG TAACTACATC ATTCTTGAAT
841 ATGTGTGATT TCTTGCCAGT ATTCAGGTGG GTTGGTTACA AAGGGCTGGA GAAGAAGATG
901 GCCTCAATTC ACAATAGAAG AAATGAATTC TTGAACAGCT TGCTTGATGA ATTTGACAC
961 AAGAAAAGTA GTGCTTCACA ATCTAACACA ACTGTTGGAA ACATGGAGAA GAAAACCACA
1021 CTGATTGAAA AGCTCTTGTC TCTTCAAGAA TCAGAGCCTG AATTCTACAC TGATGATATC
1081 ATCAAAAGTA TTATGCTGGT AGTTTTTGTT GCAGGAACAG AGACCTCATC AACCAACCATC
1141 CAATGGGTAA TGAGGCTTCT TGTAAGCTCAC CCTGAGGCAT TGTATAAGCT ACGAGCTGAC
1201 ATTGACAGTA AAGTTGGGAA TAAGCGCTTG CTGAATGAAT CAGACCTCAA CAAGCTTCCG
1261 TATTTGCATT GTGTTGTTAA TGAGACAATG AGATTATACA CTCCGATACC ACTTTTATTG
1321 CCTCATTATT CAACTAAAGA TTGTATTGTG GAAGGATATG ATGTACCAAA ACATACAATG
1381 TTGTTTGTCA ACGCTTGGGC CATTACACAG GATCCCAAGG TATGGGAGGA GCCTGACAAG
1441 TTCAAGCCAG AGAGATTTGA GGCAACAGAA GGGGAAACAG AAAGGTTCAA TTACAAGCTT
1501 GTACCATTTG GAATGGGGAG AAGAGCGTGC CCTGGAGCTG ATATGGGGTT GCGAGCAGTT
1561 TCTTTGGCAT TAGGTGCACT TATTCATGTC TTTGACTGGC AAATTGAGGA AGCGGAAAGC
1621 TTGGAGGAAA GCTATAATTC TAGAATGACT ATGCAGAACA AGCCTTTGAA GGTGTCTGTC
1681 ACTCCACGCG AAGATCTTGG CCAGCTTCTA TCCCAACTCT AAGGCAATTT ATCAATGCCA
1741 AACGTAATCT TCATCTACCA CTATG

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SEQ. ID. NO. 292

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1 MENQSYSFS SYFYLAIVLF LLPILVKYFF HRRRNLPSP FSLPIIGHLY LLKKTLLHLL
61 TSLSAKYGPV LYLKLGSMFV IVVSSPSAVE ECLTKNDIIF ANRPKTVAGD KFTYNYTVYV
121 WAPYGQLWRI LRRLTVVELF SSHSLQKTSI LRDQEVAFI RSLYKFSKDS SKKVDLTNWS
181 FTLVFNLMTK IIAGRHIKVE EDAGKEKGIE IIEKLRGTFL VTTSFLNMCD FLFVFRWVG
241 KGLEKKMASI HNRRNEFLNS LLDEFRRHKS SASQSNNTVG NMEKKTTLIE KLLSLQSESEP
301 EFTDDIIS IMLVVFVAGT ETSSTTIQWV MRLLVAHPEA LYKL RADIDS KVG NKRLLE
361 SDLNKLPYLH CVVNETMRLY TPIPLLLPHY STKDCIVEGY DVPKHTMLFV NAWAIHRDPK
421 VWEPPDKFKP ERFEATEGET ERFNYKLVPF GMGRRACPGA DMGLRAVSLA LGALIQCQFDW
481 QIEEAESLEE SYNRM TMQN KPLKVCTPR EDLGQLLSQL

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NAME D267-AF10  
 ORGANISM NICOTIANA TABACUM  
 SEQ. ID. NO. 293

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1 AACATCCTTT CCTTCTTCCA AAAATGGAGC TTCAATCTTC TCCTTTCAAT TTAATTTCTT
61 TGTTCTCTTT CTTTTCTTTT CTTTTTATTC TAGTGAAGAA ATGGAATGCC AAAATCCCAA
121 AGTTACCTCC AGGTCCGTGG AGGCTTCCCT TTATTGGAAG CCTCCATCAC TTGAAGGGAA
181 AACTTCCACA CCATAATCTT AGAGATCTAG CGCGAAAATA TGGACCTCTC ATGTACTTAC
241 AACTCGGAGA AATTCCTGTA GTTGTAAATAT CTTGCCACAG TGTAGCAAAA GCTGTACTAA
301 AAACATCATGA TCTCGCTTTT GCAACTAGAC CACGATTCAT GTCCTCAGAC ATTGTGTTTT
361 ACAAAGCAG GGACATCTCT TTTGCCCCAT TTGGTGATTA CTGGAGACAG ATGCGTAAAA
421 TATTGACTCA GGAACCTCTG AGCAACAAGA TGCTCAAGTC ATATAGCTTA ATCCGAAAGG
481 ATGAGCTCTC GAAGCTCCTC TCATCGATTG GTTTGGAAAC AGGTTCCTGCA GTGAACATAA
541 ATGAAAAGCT TCTCTGGTTT ACGAGCTGCA TGACCTGTAG ATTAGCCTTT GGAAAAATAT
601 GCAATGATCG GGATGAGTTG ATCATGCTAA TTAGGGAGAT ATTAACATTA TCAGGAGGAT
661 TTGATGTGGG TGATTTGTTT CCTTCCTGGA AATTACTTCA TAATATGAGC AACATGAAAG
721 CTAGGTTGAC GAATGTACAC CACAAGTATG ATTTAGTTAT GGAGAACATC ATCAATGAGC
781 ACCAAGAGAA TCATGCAGCA GGGATAAAGG GTAACAACGA GTTTGGTGGC GAAGATATGA
841 TCGATGCTCT ACTGAGGGCT AAGGAGAATA ATGAGCTTCA ATTTCTATC GAAAATGACA
901 ACATGAAAGC AGTAATTCTG GACTTGTTTA TTGCTGGAAC TGAAACTTCA TATACTGCAA
961 TTATATGGGC ACTATCAGAA TTGATGAAGC ACCCAAGTGT GATGGCCAAG GCACAAGCTG
1021 AAGTGAGAAA AGTCTTCAAA GAAAATGAAA ATTTTCGACGA AAATGATCTT GACAAGTTGC
1081 CATACTAAA ATCAGTGATT AAAGAAACAC TAAGGATGCA CCCTCCAGTT CTTTGTGTTAG
1141 GGCCTAGAGA ATGCAGGGAC CAAACAGAGA TCGATGGCTA CACTGTACCT ATTAAAGCTA
1201 GAGTTATGGT TAATGCTTGG GCGATAGGAA GAGATCCTGA AAGTTGGGAA GATCCTGAAA
1261 GTTTCAAACC GGAGCGATTT GAAAATACTT CTGTTGATCT TACAGGAAAT CACTATCAGT
1321 TCATTCCTTT CGGTTTCAGGA AGAAGAATGT GTCCAGGAAT GTCGTTTGGT TTAGTTAACA
1381 CAGGGCATCC TTTAGCCAG TTGCTCTATT GCTTTGACTG GAAACTCCCT GACAAGGTTA
1441 ATGCAAATGA TTTTCGCACT ACTGAAACAA GTAGAGTTTT TGCAGCAAGC AAAGATGACC
1501 TCTACTTGAT TCCCACAAAT CACAGGGAGC AAGAATAGCT TAATTTAATG GAGTTCCTGG
1561 AAGAATTAAG GAAGAAGGGC TATATAGGTG AGATTTTTTG TATGGTTGCA AGGTTTTTAG
1621 TTCATACAAT AAGACAATAC ATTATATTCC AGTATTGTGT ATCATGTATA ATAAGGTTCC
1681 TTTTGTTTAA AAAA

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SEQ. ID. NO. 294

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1 MELQSSPFNL ISLFLFFSFL FILVKKWNK IPKLPPGPWR LPFIGSLHHL KGKLPHHNLR
61 DLARKYGPLM YLQLGEIPVV VISSPRVAKA VLKTHDLAFA TRPRFMSSDI VFYKSRDISF
121 APFGDYWRQM RKILTQELLS NKMLKSYSLL RKDELSKLLS SIRLETGSAV NINEKLLWFT
181 SCMTCRLAFG KICNDRDELI MLIREILTLS GGFVDVGLFP SWKLLHNMNSN MKARLTNVHH
241 KYDLVMENII NEHQENHAAG IKGNNEFGGE DMIDALLRAK ENNELQFPPIE NDNMKAVILD
301 LFIAGTETSY TAIIWALSEL MKHPSVMAKA QAEVRKVFE NENFDENDLD KLPYLKSVIK
361 ETLRMHPPVP LLGPRECRDQ TEIDGYTVPI KARVMVNAWA IGRDPESWED PESFKPERFE
421 NTSVDLTGNH YQFIFPGSGR RMCPGMSFGL VNTGHPLAQL LYCFDWKLPD KVNANDFRTT
481 ETSRVFAASK DDLYLIPTNH REQE

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NAME D284-AH5  
ORGANISM NICOTIANA TABACUM  
SEQ. ID. NO. 295

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1 CAATCAGTGG ATGCGGGAGT AATATATAAT ATGCAAGTTG TAGAAAGAGA AAAAAAAAAAT
61 CAAGTAGCTA TTCTATACTG GGGCACAAAT AGTGAGTGAA AATGGAGACT GTTCAAATCA
121 TAATAACAGC ATCTTGTGCT GCCATAATAA TTACTCTAGT GGTGTGTATT TGGAGAGTAC
181 TGAATTGGGT TTGGTTCAGA CCAAAGAAGC TGGAAAAACT ATTGAGGAAA CAAGGTCTCA
241 AAGGCAACTC CTACAAGATT TTGTATGGGG ATATGAAGGA GCTTTCTGGT ATGATTAAGG
301 AAGCTAATTC CAAACCCATG AATCTTTCTG ATGATATTGC ACCAAGATTG GTGCCTTTCT
361 TTCTTGACAC CATCAAGAAA TATGGTAAAA AATCCTTTGT ATGGTTAGGT CCGAAACCAC
421 TGGTTCCTAT CATGGACCCT GAGCTTATAA AGGAAATATT TTCCAAATAC TATCTGTATC
481 AAAAGCCTCA TGGAAATCCA GTTACCAAGC TATTAGTACA AGGACTAGTA AGCCTAGAGG
541 AAGACAAATG GGCCAAACAT AGAAAAATCA TCAATCCAGC TTTCCATCTA GAGAAGCTAA
601 AGCATATGCT TCCAGCTTTT TGCTTGAGCT GCACTGAGAT GCTGTGCAAA TGGGAAGATA
661 TTGTTTCAAT TAAGGGCTCA CATGAGATAG ATGTATGGCC TCACCTTGAA CAATTAAGTA
721 GCGATGTGAT CTCTCGGACA GCTTTTGGCA GTAACCTTGA AGAAGGTAAA AGGATATTTG
781 AACTTCAGAA GGAACAAGCT CAGTATTTTG TAGAAGCTAT ACGCTCGGTT TATATACCAG
841 GCTGGAGGTT TTTGCCAACA AAGAGGAACA GAAGAATGAA GGAAGTTGAA AAGGATGTTT
901 GGCCTCGAT AAGAGGCATT ATTGATAAAA GAGTGAAGGC AATGAAAGCA GGAGAGGCGA
961 GTAATGAGGA TCTACTTGGT ATATTGTTGG AATCTAATTT TACAGAAGCT GAACAGCATA
1021 GACACAAGGA TTCTGCGATG AGCATTGAAG AAGTCATTCA AGAATGCAAG TTATTCTATG
1081 TTGCTGGCCA AGAAACTACA TCAGTGTTGC TTGTGTGGAC TCTAATATTG TTGAGTAGGC
1141 ATCAAGATTG GCAGAGCCGA GCCAGAGAAG AGGTGTTTCA AGTCTTTGGT AATCAGAAAC
1201 CAGATTTTGA CGGATTGAAT CGTCTAAAAA TTGTGACAAT GATCTTGTAT GAGTCTTTAA
1261 GGCTATACTC CCCAGTAGTG TCACTAATCC GCGCGCCTAA TGAGGATGCT ATATTAGGAA
1321 ATGTATCTCT GCCAGAAGGT GTGCTACTCT CATTACCAGT GATCTTATTA CACCACGATG
1381 AAGAGATATG GGGTAAAGAT GCAAAGAAGT TCAATCCAGA AAGATTTAGA GATGGAGTCT
1441 CAAGTGCAAC AAAGGGTCAA GTCACCTTTT TTCCATTTAC TTGGGGTCCC AGAATATGCA
1501 TCGGACAAAA TTTTGCCATG TTAGAAGCAA AGACTGCTTT GGCTATGATC CTACAACGCT
1561 TCTCATTCGA ACTGTCTCCA TCTTATGCAC ATGCTCCTCA GTCCATATTA ACTATGCAAC
1621 CCCAACATGG TGCTCCACTA ATTCTGCACA AAATATAGTT TGTTACTTTA AGCAGTGTCT
1681 TGTTATATGT CAGAGAGTCC AAAATGTTTA ATTAAGGCTT GTAGAACTGC CAAATGGAAC
1741 TTCATTTGCA TTCGTGGGTT GTAGATTGTT GTAATTGGAC AAGTATACTG TTTATTTTAG
1801 AGTTTTAAGA AAAAAAAAAA

```

SEQ. ID. NO. 296

```

1 METVQIIITA SCAIIITLV VCIWRVLNWF WFRPKKLEKL LRKQGLKGNS YKILYGDMKE
61 LSGMIKEANS KPMNLSDDIA PRLVPFFLDI IKKYGKKSFV WLGPKPLVLI MDPPELIKEIF
121 SKYYLYQKPH GNPVTKLLVQ GLVSLSEEDKW AKHRKIINPA FHLEKLKHL PAFCLSCTEM
181 LCKWEDIVSI KGSHEIDVWP HLEQLSSDVI SRTAFGSNFE EGKRIFELQK EQAQYFVEAI
241 RSVYIPGWRP LPTKRNRMRK EVEKDVRASI RGIIDKRVKA MKAGEASNED LLGILLESNF
301 TEAEQHRHKD SAMSIEEVIQ ECKLFYVAGQ ETTSVLLVWT LILLSRHQDW QSRAREEVFQ
361 VFGNQKPDFD GLNRLKVVTM ILYESLRLYS PVVSLIRPN EDAILGNVSL PEGVLLSLPV
421 ILLHHDEEIW GKDAKKFNPE RFRDGVSSAT KGQVTFPPFT WGPICIGQN FAMLEAKTAL
481 AMILQRFSE LSPSYAHAPQ SILTMQPPHG APLILHKI

```

**Figure 149: Amino Acid Identity of Group Members**

**Group 1**

AQLAINLVTSMGLHLLHHFTWAPAPGVNPEDIDLEESPGTVTYMKNPIQAIPTPRLPAHLYGRVPVDM	SEQ ID No. : 2 D58-BG7
	(98.5)
AQLAINLVTSMGLHLLHHFTWAPPPGVNPENIDLEESPGTVTYMKNPIQAIPTPRLPAHLYGRVPVDM	SEQ ID No. : 4 D58-AB1

**Group 2**

QLAINLVTSMLGHLFIILHGLRPRGLTRRILTWRRALEQ

**Group 3**

EGLAVRMVALSLGCI IQCFDWQRIGEE LVD MTEGTGLTLPKAQPLVAKCSPRPKMANLLSQI SEQ ID No.:10 D56-AH7  
| | |  
EGLAIRMVALLSGCI IQCFDWQLRGEGLVDKTEGTGLTLPKAQPLVAKCSPRPIMANLLSQI SEQ ID No.:12 D13a-5

**Group 4**

IGFATLVTHLTFGRLLQGFDPSKPSNTPIDMTEGVGVTLPKVNQVEVLITPRLP SKLYLF	SEQ ID No.:14 D56-AG10
	(93.3)
INFATLVTHLTFGRLLQGFDSTPSNTPIDMTEGVGVTLPKVNQVEVLISPRLP SKLYVF	SEQ ID No.:18 D34-62

**Group 5**

IILALPILGITLGRLVQNFE <del>LL</del> PPPGQSKLDTTEKGGQFSLHILKHSTIVLKPRSF	SEQ ID No.:20 D56-AA7
	(98.2)
IILALPILGITLGRLVQNFE <del>LL</del> PPPGQSKLDTTEKGGQFSLHILKHSTIV <del>MK</del> PRSF	SEQ ID No.:144 D185-BD3
	(96.4)
IILALPILGITLGRLVQNFE <del>LL</del> PPPGQSKLDTTEKGGQFSLHILKHSTIVLKPRSC	SEQ ID No.:22 D56-AE1

**Group 6**

I	A	L	G	V	A	S	M	E	L	A	L	S	N	L	L	Y	A	F	D	W	E	L	P	F	G	M	K	K	E	D	I	D	T	N	A	R	P	G	I	T	M	H	K	K	N	E	L	Y	L	I	P	K	N	Y	L	SEQ ID No.:24	D35-BB7									
																																																								(92.8)										
I	A	L	G	V	A	S	M	E	L	A	L	S	N	L	L	Y	A	F	D	W	E	L	P	Y	G	V	K	K	E	N	I	D	T	N	V	R	P	G	I	T	M	H	K	K	N	E	L	C	L	I	P	R	N	Y	L	SEQ ID No.:26	D177-BA7									
																																																								(96.4)										
I	A	L	G	V	A	S	M	E	L	A	L	S	N	L	L	Y	A	F	D	W	E	L	P	Y	G	V	K	K	E	D	I	D	T	N	V	R	P	G	I	A	M	H	K	K	N	E	L	C	L	V	P	K	N	Y	L	SEQ ID No.:28	D56A-AB6									
																																																								(94.6)										
I	A	L	G	V	A	S	M	E	L	A	L	S	N	L	L	Y	A	F	D	W	E	L	P	Y	G	V	K	K	E	D	I	D	T	N	V	R	P	G	I	A	M	H	K	K	N	E	L	C	L	V	P	K	L	F	I	N	Y	I	G	T	W	I	S	C	SEQ ID No.:30	D144-AE2

**Group 7**

ISFGLANAYLPLAQLLYHFDWELPTGIKPSDDLDTLVGVTAARKSDLYLVATPYQPPQN	SEQ ID No.:32 D56-AG11
	(93.3)
ISFGLANAYLPLAQLLYHFDWKLPAGIEPSDDLDTLVGVTAARKSDLYLVATPYQPPQK	SEQ ID No.:34 D179-AA1

**Group 8**

MLFGLANVGQPLAQLLYHFDWKLPNGQSHENFDMTESPGISATRKDDLVLATPYDSY SEQ ID No.:36 D56-AC7  
 ||| |  
 MLFGLANVGQPLAQLLYHFDWKLPNGQTHQNFDMTESPGISATRKDDLILITPAHS SEQ ID No.:38 D144-AD1

**Group 9**

LLFGLVNVGHPLAQLLYHFDWKTLPGISSDSFDMTETDGVTAGRKDDLCLIATPFGLN

SEQ ID No.:40 D144-AB5

**Group 10**

MSFGLVNTGHPPLAQLLYFFDWKFPFKVNAADFHTTETSRVFAASKDDLYLIPTNHMEQE

SEQ ID No.:42 D181-AB5

MSFGLVNTGHPPLAQLLYCFDWKLPDKVNANDFRTTETSRVFAASKDDLYLIPTNHREQE

| | | | |

(89.8)

SEQ ID No.:44 D73-Ac9

**Group 11**

MQFGLALVTLPLAHLHNFWDWKLPEGINARDLDMTEANGISARREKDLYLIATPYVSPLD

SEQ ID No.:46 D56-AC12

**Group 12**

MTYALQVEHLTMAHLIQGFNYRTPTEPLDMKEGAGITIRKVNPKVVIITPRLAPELY

SEQ ID No.:48 D58-AB9

MTYALQVEHLTMAHLIQGFNYKTPNDEALDMKEGAGITIRKVNPKVLIITPRLAPELY

| | | | |

(89.6)

SEQ ID No.:50 D56-AG9

MTYALQVEHLTMAHLIQGFNYKTPNDEALDMKEGAGITIRKVNPKVLIITPRLAPELY

| | | | |

(98.2)

SEQ ID No.:52 D56-AG6

MTYALQVEHLTMAHLIQGFNYRTPNDEPLDMKEGAGITIRKVNPKVLIITPRLAPELY

| | | | |

(94.8)

SEQ ID No.:54 D35-BG11

MTYALQVEHLTMAHLIQGFNYRTPNDEPLDMKEGAGITIRKVNPKVLIITPRLAPELY

| | | | |

(98.3)

SEQ ID No.:56 D35-42

MTYALQVEHLTMAHLIQGFNYRTPNDEPLDMKEGAGITIRKVNPKVLIITPRLAPELY

| | | | |

(98.3)

SEQ ID No.:58 D35-BA3

MTYALQVEHLTMAHLIQGFNYRTPNDEPLDMKEGAGITIRKVNPAELIITPRLAPELY

| | | | |

(84.5)

SEQ ID No.:60 D34-57

MTYALQVEHLTMAHLIQGFNYKTPNDEPLDMKEGAGITIRKVNPKVEVTTTARLAPELY

| | | | |

(98.3)

SEQ ID No.:62 D34-52

MTYALQVEHLTMAHLIQGFNYKTPNDEPLDMKEGAGITIRKVNPKVEVTTTARLAPELY

| | | | |

**Group 13**

YSLGLKVIRVTLANMLHGFNWKLPEGMKPEDISVEEHYGLTTHPKFPVPVILESRSSDLYSPIT

SEQ ID No.:66 D56-AD10

**Group 14**

YSLGIRIIRATLANLLHGFNWRLPNGMSPEDISMEIYGLITHPKVALDVMMEPRLPNHLYK

SEQ ID No.:68 D56-AA11

**Group 15**

INFSIPLVELALANLLFHYNWSLPEGMLAKDQVDMEEALGITMHKKSPLCLVASHYTC

SEQ ID No.:70 D177-BD5

INFSIPLVELALANLLFHYNWSLPEGMLPKDQVDMEEALGITMHKKSPLCLVASHYNLL

| | | | |

(94.7)

SEQ ID No.:84 D177-BD7

**Group 16**

MQLGLYALEMAVAHLLLCFTWELPDGMKPSELKMDDIFGLTAPRANRLVAVPSPRLLCPLY

SEQ ID No.:74 D58-BC5

MQLGLYALEMAVAHLLHCFTWELPDGMKPSELKMDDIFGLTAPRANRLVAVPTPRLLCPLY

| | | | |

(96.7)

SEQ ID No.:76 D58-AD12

MQLGLYALEMAVAHLLHCFTWELPDGMKPSELKMDDIFGLTAPRANRLVAVPTPRLLCPLY

| | | | |

(98.4)

SEQ ID No.:72 D56A-AG10

**Group 17**

MLWSASIVRVSYLTCTYRFQVYAGSVFRVA

SEQ ID No.:78 D56-AC11

MLWSASIVRVSYLTCIYRFQVYAGSVSRVA

(96.7)  
SEQ ID No.:88 D56-AD6F

**Group 18**

LNFMALAKMALALILQHYAFELSPSYAHAPHTIITLQPHGAPLILRK

SEQ ID No.:90 D73A-AD6

**Group 19**

QNFATLEAKMAIAMILQRFSEFELSPSYTHSPYTVVTLKPKYGAPLIMHRL  
 | | | | | | | | | | | | | | | | | |  
 QNFAMLEAKMALSMILQRFSEFELSPSYAHAPQSILTVQPOYGAPLIFHKL  
 | | | | | | | | | | | | | | | | | |  
 INFAMTEAKMAMAMILQRFSEFELSPSYTHAPQSVITMQPOYGAPLILHKL  
 | | | | | | | | | | | | | | | | | |  
 INFAMAEAKMAMAMILQRFSEFELSPSYTHAPQSVITMQPOYGAPLILHKL  
 | | | | | | | | | | | | | | | | | |  
 QNFAMMEAKMAVAMILHKFSFELSPSYTHAPFAIVTTHPQYGAPLLMRRL  
 | | | | | | | | | | | | | | | | | |  
 QNFAMMEAKMAVAMILQKFSFELSPSYTHAPFAIVTTHPQYGAPLLMRRL

SEQ ID No.:96 D70A-AB5  
 (72.0)  
 SEQ ID No.:100 D70A-AB8  
 (82.0)  
 SEQ ID No.:102 D70A-BH2  
 (98.0)  
 SEQ ID No.:104 D70A-AA4  
 (70.0)  
 SEQ ID No.:108 D70A-BA9  
 (98.0)  
 SEQ ID No.:106 D70A-BA1

**Group 20**

QNFAMLEAKMAMAMILKTYAFELSPSYAHAPHPLLLQPOYGAQLILYKL

SEQ ID No.:110 D70A-BD4

**Group 21**

YSMGLKAIQASLANLLHGFNWSLPDNMTPEDLNMDEIFGLSTPKKFPLATVIEPRLSPKLYSV  
 | | | | | | | | | | | | | | | | | |  
 YSLGLKEIQASLANLLHGFNWSLPDNMTPEDLNMDEIFGLSTPKKFPLATVIEPRLSPKLYSV  
 | | | | | | | | | | | | | | | | | |  
 HSLGLKVIQASLANLLHGFNWSLPDNMTPEDLNMDEIFGLSTPKKFPLATVIEPRLSPKLYSV

SEQ ID No.:112 D181-AC5  
 (96.8)  
 SEQ ID No.:114 D144-AH1  
 (96.8)  
 SEQ ID No.:116 D34-65

**Group 22**

LCFPCLISSYILALNVNLYHNFLQISPSISY

SEQ ID No.:118 D35-BG2

**Group 23**

SGLAQCVVGLALATLVQCFEWKRVSEEVVDLTEGKGLTMPKPEPLMARCEARDIFHKVLSEIS

SEQ ID No.:120 D73A-AH7

**Group 24**

LGLATVHVNLMMLARMIQEFESAYPENRKVDLLRNWNLLW  
 | | | | | | | | | | | | | | | | | |  
 LGLATVHVNLMMLARMIQEFESAYPENRKVDFTKLEFTVVMKNPLRAKVKPRMQVV  
 | | | | | | | | | | | | | | | | | |  
 LGLATVHVNLMMLARTIQEFESAYPENRKVDFTKLEFTVVMKNPLRAKVKPRMQVV

SEQ ID No.:136 D185-BG2  
 (77.5)  
 SEQ ID No.:122 D58-AA1  
 (98.2)  
 SEQ ID No.:134 D185-BC1

SEQ ID No.:124 D73A-AE10

SEQ ID No.:126 D56A-AC12

SEQ ID No.:140 D185-BD2

SEQ ID No.:130 D73A-AG3

SEQ ID No.: 86 176-BF2

SEQ ID No.:146 D176-BC3

SEQ ID No.:148 D176-BB3

SEQ ID No.: 6 D186-AH4

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FIGURE 150: COMPARISON OF SEQUENCE GROUPS

ALIGNMENT OF GROUP 1

```

D58-BG7      GCACAACCTTGCTATCAACTTGGTCACATCTATGTTGGGTCATTTGTTGCATCATTTTACA  SEQ ID No 1
D58-AB1      GCACAACCTTGCTATCAACTTGGTCACATCTATGTTGGGTCATTTGTTGCATCATTTTACG  SEQ ID No 3
D58-BE4      GCACAACCTTGCTATCAACTTGGTCACATCTATGTTGGGTCATTTGTT-CATCATTTTACA  SEQ ID No 7
              *****
D58-BG7      TGGGCTCCGGCCCCGGGGGTTAACCCGGAGGATATTGACTTGGAGGAGAGCCCTGGAACA
D58-AB1      TGGGCTCCGGCCCCGGGGGTTAACCCGGAGAATATTGACTTGGAGGAGAGCCCTGGAACA
D58-BE4      TGGGCTCCGGCCCCGGGGGTTAACCCGGAGGATATTGACTTGGAGGAGAGCCCTGGAACA
              *****
D58-BG7      GTAACCTACATGAAAAATCCAATACAAGCTATTCCAACCTCCAAGATTGCCTGCACACTTG
D58-AB1      GTAACCTACATGAAAAATCCAATACAAGCTATTCCCTACTCCAAGATTGCCTGCACACTTG)
D58-BE4      GTAACCTACATGA-----
              *****

D58-BG7      TATGGACGTGTGCCAGTGGATATGTAA
D58-AB1      TATGGACGTGTGCCAGTGGATATGTAA
D58-BE4      -----

```

PERCENT IDENTITY OF GROUP 1

	D58-BG7	D58-BE4	D58-AB1	
D58-BG7	***	96.2	98.1	SEQ ID No 1
D58-BE4		***	94.0	SEQ ID No 7
D58-AB1			***	SEQ ID No 3

ALIGNMENT OF GROUP 2

```

D56-AH7      GAAGGATTGGCTGTTTCGAATGGTTGCCTTGTCATTGGGATGTATTATTCAATGTTTGGAT  SEQ ID No 9
D13a-5      GAAGGATTGGCTATTTCGAATGGTTGCATTGTTCATTGGGATGTATTATTCAATGCTTTGAT  SEQ ID No 11
              *****
D56-AH7      TGGCAACGAATCGGCGAAGAATTGGTTGATATGACTGAAGGAAGTGGACTTACTTTGCCT
D13a-5      TGGCAACGACTTGGGGAAGGATTGGTTGATAAGACTGAAGGAAGTGGACTTACTTTGCCT
              *****
D56-AH7      AAAGCTCAACCTTTGGTGGCCAAGTGTAGCCACGACCTAAAATGGCTAATCTTCTCTCT
D13a-5      AAAGCTCAACCTTTAGTGGCCAAGTGTAGCCACGACCTATAATGGCTAATCTTCTTTCT
              *****
D56-AH7      CAGATTGGA
D13a-5      CAGATTGGA
              *****

```

PERCENT IDENTITY OF GROUP 2

	D56-AH7	D13a-5	
D56-AH7	***	93.7	SEQ ID No 9
D13a-5		***	SEQ ID No 11

FIGURE 150: COMPARISON OF SEQUENCE GROUPS

ALIGNMENT OF GROUP 3

```

D56-AG10      ATAGGTTTTGCGACTTTAGTGACACATCTGACTTTTGGTCGCTTGCTTCAAGGTTTGTGAT  SEQ ID No 13
              |
D35-33        ATAGGCTTTGCGACTTTAGTGACACATCTGACTTTTGGTCGCTTGCTTCAAGGTTTGTGAT  SEQ ID No 15
              |||
D34-62        ATAAATTTTGGCGACTTTAGTGACACATCTGACTTTTGGTCGCTTGCTTCAAGGTTTGTGAT  SEQ ID No 17
              ***
              *****

D56-AG10      TTTAGTAAGCCATCAAACACGCCAATTGACATGACAGAAGGCGTAGGCGTTACTTTGCCT
              |
D35-33        TTTAGTAAGCCATCAAACACGCCAATTGACATGACAGAAGGCGTAGGCGTTACTTTGCCT
              |
D34-62        TTTAGTACGCCATCAAACACGCCAATTAGACATGACAGAAGGCGTAGGCGTTACTTTGCCT
              *****

D56-AG10      AAGGTAAATCAAGTTGAAGTTCTAATTACCCCTCGTTTACCTTCTAAGCTTTATTATTTTGA
              |
D35-33        AAGGTAAATCAAGTTGAAGTTCTAATTACCCCTCGTTTACCTTCTAAGCTTTATTAT-----
              |
D34-62        AAGGTAAATCAAGTTGAAGTTCTAATTAGCCCTCGTTTACCTTCTAAGCTTTATGTATTCTGA
              *****

```

PERCENT IDENTITY OF GROUP 3

	D56-AG10	D35-33	D34-62	
D56-AG10	***	98.9	95.1	SEQ ID No 13
D35-33		***	94.4	SEQ ID No 15
D34-62			***	SEQ ID No 17

ALIGNMENT OF GROUP 4

```

D56-AA7      ATTATACTTGCAATGCGCAATTCTTGGCATCACTTTGGGACGTTTGGTTCAGAACTTTGAG
              |
D56-AE1      ATTATACTTGCAATGCGCAATTCTTGGCATCACTTTGGGACGTTTGGTTCAGAACTTTGAG
              |
D185-BD3     ATTATCCTTGCACTGCGCAATTCTTGGCATCACTTTGGGACGTTTGGTTCAGAACTTTGAG
              *****

D56-AA7      CTGTTGCCTCCTCCAGGCCAGTCGAAGCTCGACACCACAGAGAAAGGTGGACAGTTCAGT
              |
D56-AE1      CTGTTGCCTCCTCCAGGCCAGTCGAAGCTCGACACCACAGAGAAAGGTGGACAGTTCAGT
              |
D185-BD3     TTGTTGCCTCCTCCAGGACAGTCAAAGCTTGACACAACAGAGAAAGGCGGGCAATTTCAGT
              *****

D56-AA7      CTCCACATTTTGAAGCATTCCACCATTGTGTTGAAACCAAGGTCTTTCTGA
              |
D56-AE1      CTCCATATTTTGAAGCATTCCACCATTGTGTTGAAACCAAGGTCTTGCTGA
              |
D185-BD3     CTGCACATTTTGAAGCATTCCACCATTGTGATGAAACCAAGATCTTTTAA
              **

```

PERCENT IDENTITY OF GROUP 4

	D56AA7	D56-AE1	D185-BD3	
D56AA7	***	98.2	87.7	SEQ ID No 19
D56-AE1		***	87.1	SEQ ID No 21
D185-BD3			***	SEQ ID No 143

FIGURE 150: COMPARISON OF SEQUENCE GROUPS

ALIGNMENT OF GROUP 5

```

D56A-AB6      ATTGCACTTGGGGTTGCATCCATGGAACCTTGCTTTGTCAAATCTTCTTTATGCATTTGAT  SEQ ID No 27
D35-BB7       ATTGCACTTGGGGTTGCATCAATGGAACCTTGCAATTTGTCAAATCTTCTTTATGCATTTGAT  SEQ ID No 23
D177-BA7      ATTGCACTTGGGGTTGCATCCATGGAACCTTGCTTTGTCAAATCTTCTTTATGCATTTGAT  SEQ ID No 25
D144-AE2      ATTGCACTTGGGGTTGCATCCATGGAACCTTGCTTTGTCAAATCTTCTTTATGCATTTGAT  SEQ ID No 29
*****
D56A-AB6      TGGGAGTTGCCTTATGGAGTGAAAAAAGAAGACATCGACACAAACGTTAGGCCTGGAATT
D35-BB7       TGGGAGTTACCTTTTGGGAATGAAAAAAGAAGACATTGACACAAACGCCAGGCCTGGAATT
D177-BA7      TGGGAGTTACCTTACGGAGTGAAAAAAGAAACATTGACACAAATGTCAGGCCTGGAATT
D144-AE2      TGGGAGTTGCCTTATGGAGTGAAAAAAGAAGACATCGACACAAACGTTAGGCCTGGAATT
*****
D56A-AB6      GCCATGCACAAGAAAAACGAACTTTGCCTTGTCCCAAAAAA-TTATTTATAA-----
D35-BB7       ACCATGCATAAGAAAAACGAACTTTATCTTATCCCTAAAAA-TTATCTATAG-----
D177-BA7      ACCATGCATAAGAAAAACGAACTTTGCCTTATCCCTAGAAA-TTATCTATAG-----
D144-AE2      GCCATGCACAAGAAAAACGAACTTTGCCTTGTCCCAAAAAAATTATTTATAAATTAT
*****
D56A-AB6      -----
D35-BB7       -----
D177-BA7      -----
D144-AE2      |||||
ATTGGGACGTGGATCTCATGCTAG

```

PERCENT IDENTITY OF GROUP 5

	D56A-AB6	D35-BB7	D144-AE2	D177-BA7	
D56A-AB6	***	90.6	97.1	91.8	SEQ ID No 27
D35-BB7		***	87.7	93.0	SEQ ID No 23
D144-AE2			***	88.9	SEQ ID No 29
D177-BA7				***	SEQ ID No 25

ALIGNMENT OF GROUP 6

```

D56-AG11      ATTTGTTTGGTTTAGCTAATGCTTATTTGCCATTGGCTCAATTACTTTATCACTTTGAT
D179-AA1      ATTTGTTTGGCTTAGCTAATGCTTATTTGCCATTGGCTCAATTACTATATCACTTCGAT
*****
D56-AG11      TGGGAACCTCCCACTGGAATCAAACCAAGCGACTTGGACTTGACTGAGTTGGTTGGAGTA
D179-AA1      TGGAAACTCCCTGCTGGAATCGAAACCAAGCGACTTGGACTTGACTGAGTTGGTTGGAGTA
***
D56-AG11      ACTGCCGCTAGAAAAAGTGACCTTTACTTGGTTGCGACTCCTTATCAACCTCCTCAAACTGA
D179-AA1      ACTGCCGCTAGAAAAAGTGACCTTTACTTGGTTGCGACTCCTTATCAACCTCCTCAAAAGTGA
*****

```

FIGURE 150: COMPARISON OF SEQUENCE GROUPS

PERCENT IDENTITY OF GROUP 6

	SEQ ID No 31	SEQ ID No 33	
D56-AG11	D56-AG11	D179-AA1	
D179-AA1	***	95.6	SEQ ID No 31
		***	SEQ ID No 33

ALIGNMENT OF GROUP 7

D56-AC7	ATGCTATTGGTTTAGCTAATGTTGGACAACCTTTAGCTCAGTTACTTTATCACTTCGAT	SEQ ID No 35
D144-AD1	ATGCTATTGGTTTAGCTAATGTTGGACAACCTTTAGCTCAGTTACTTTATCACTTCGAT *****	SEQ ID No 37
D56-AC7	TGGAAACTCCCTAATGGACAAAGTCATGAGAATTTCGACATGACTGAGTCACCTGGAATT	
D144-AD1	TGGAAACTCCCTAATGGACAAACTCACCAAATTCGACATGACTGAGTCACCTGGAATT ***** * *****	
D56-AC7	TCTGCTACAAGAAAGGATGATCTTGTGTTTGATTGCCACTCCTTATGATTCTTATTAA	
D144-AD1	TCTGCTACAAGAAAGGATGATCTTATTTTGATTGCCACTCCTGCTCATTCTTGA ***** * *****	

PERCENT IDENTITY OF GROUP 7

	D144-AD1	D56-AC7	
D144-AD1	***	94.3	SEQ ID No 37
D56-AC7F		***	SEQ ID No 35

ALIGNMENT OF GROUP 9

D181-AB5	ATGTCGTTTGGTTTAGTTAACACTGGGCATCCTTTAGCTCAGTTGCTCTATTTCTTTGAC	SEQ ID No 41
D73-AC9	ATGTCGTTTGGTTTAGTTAACACAGGGCATCCTTTAGCCAGTTGCTCTATTGCTTTGAC *****	SEQ ID No 43
D181-AB5	TGGAAATTCCTCATAAGGTTAATGCAGCTGATTTTCACACTACTGAAACAAGTAGAGTT	
D73-AC9	TGGAAATTCCTGACAAGGTTAATGCAAATGATTTTCGCACTACTGAAACAAGTAGAGTT ***** * *****	
D181-AB5	TTTGCAGCAAGCAAAGATGACCTCTACTTGATTCCAACAAATCACATGGAGCAAGAGTAG	
D73-AC9	TTTGCAGCAAGCAAAGATGACCTCTACTTGATTCCCAACAAATCACAGGGAGCAAGAATAG *****	

PERCENT IDENTITY OF GROUP 9

	D181-AB5	D73-AC9	
D181-AB5	***	92.8	SEQ ID No 41
D73-AC9		***	SEQ ID No 43

FIGURE 150: COMPARISON OF SEQUENCE GROUPS

ALIGNMENT OF GROUP 11

D58-AB9	ATGACTTATGCATTGCAAGTGGAAACACCTAACAATGGCACATTTGATCCAGGGTTTCAAT	SEQ ID No 47
D56-AG9	ATGACTTATGCATTGCAAGTGGAAACACCTAACAATGGCACATTTAATCCAGGGTTTCAAT	SEQ ID No 49
D35-BG11	ATGACTTATGCATTGCAAGTGGAAACACTTAACAATGGCACATTTGATCCAAGGTTTCAAT	SEQ ID No 53
D34-25	ATGACTTATGCATTACAAGTGGAAACACCTAACAATAGCACATTTGATCCAGGGTTTCAAT	SEQ ID No 63
D35-BA3	ATGACTTATGCATTGCAAGTGGAAACACTTAACAATGGCACATTTGATCCAAGGTTTCAAT	SEQ ID No 57
D34-52	ATGACTTATGCATTACAAGTGGAAACACCTAACAATAGCACATTTGATCCAGGGTTTCAAT	SEQ ID No 61
D56-AG6	ATGACTTATGCATTGCAAGTGGAAACACCTAACAATGGCACATTTAATCCAGGGTTTCAAT	SEQ ID No 51
D35-42	ATGACTTATGCATTGCAAGTGGAAACACTTAACAATGGCACATTTGATCCAAGGTTTCAAT	SEQ ID No 55
D34-57	ATGACTTATGCATTACAAGTGGAAACACCTAACAATAGCACATTTGATCCAGGGTTTCAAT	SEQ ID No 59
	*****	
D58-AB9	TACAGAACTCCAATGATGAGCCCTTGATATGAAGAAGGTGCAGGCATAACTATACGT	
D56-AG9	TACAAAACCTCAAATGACGAGGCCCTTGATATGAAGGAAGGTGCAGGCATAACTATACGT	
D35-BG11	TACAGAACTCCAATGACGAGGCCCTTGATATGAAGGAAGGTGCAGGCATAACTATACGT	
D34-25	TACAAAACCTCAAATGACGAGGCCCTTGATATGAAGGAAGGTGCAGGATTAACATATACGT	
D35-BA3	TACAGAACTCCAATGACGAGGCCCTTGATATGAAGGAAGGTGCAGGCATAACTATACGT	
D34-52	TACAAAACCTCAAATGACGAGGCCCTTGATATGAAGGAAGGTGCAGGATTAACATATACGT	
D56-AG6	TACAAAACCTCAAATGACGAGGCCCTTGATATGAAGGAAGGTGCAGGCATAACAATACGT	
D35-42	TACAGAACTCCAATGACGAGGCCCTTGATATGAAGGAAGGTGCAGGCATAACTATACGT	
D34-57	TACAAAACCTCAAATGACGAGGCCCTTGATATGAAGGAAGGTGCAGGATTAACCATACGT	
	****	
D58-AB9	AAGGTAAATCCTGTGAAAGTGATAATTACGCCTCGCTTGGCACCTGAGCTTTATTAA	
D56-AG9	AAGGTAAATCCTGTGGAAGTGATAATAGCGCCTCGCCTGGCACCTGAGCTTTATTAA	
D35-BG11	AAGGTAAATCCTGTGGAAGTGATAATAGCGCCTCGCCTGGCACCTGAGCTTTATTAA	
D34-25	AAAGTAAATCCTGTAGAAGTGACAATTACGGCTCGCCTGGCACCTGAGCTTTATTAA	
D35-BA3	AAGGTAAATCCTGCGGAAGTGATAATAGCGCCTCGCCTGGCACCTGAGCTTTATTAA	
D34-52	AAAGTAAATCCTGTAGAAGTGACAATTACGGCTCGCCTGGCACCTGAGCTTTATTAA	
D56-AG6	AAGGTAAATCCAGTGGAATTGATAATAACGCCCTCGCTTGGCACCTGAGCTTTACTAA	
D35-42	AAGGTAAATCCTGTGGAAGTGATAATAGCGCCCC--TGGCACCTGAGCTTTATTAA	
D34-57	AAAGTAAATCCTGTAGAAGTGACAATAACGGCTCGCCTGGCACCTGAGCTTTATTAA	
	**	

FIGURE 150: COMPARISON OF SEQUENCE GROUPS

PERCENT IDENTITY OF GROUP 11

	D58-AB9	D56-AG6		D35-42		D34-57		D34-25		
		D56-AG9		D35-BG11		D35-BA3		D34-52		
D58-AB9	***	93.8	93.2	94.3	90.8	93.2	90.9	92.0	91.5	SEQ ID No 47
D56-AG9		***	96.6	97.2	94.2	96.6	91.5	92.6	92.0	SEQ ID No 49
D56-AG6			***	93.8	90.2	92.6	90.3	90.9	90.3	SEQ ID No 51
D35-BG11				***	97.1	99.4	90.9	92.0	91.5	SEQ ID No 53
D35-42					***	96.5	87.3	88.4	87.9	SEQ ID No 55
D35-BA3						***	90.3	91.5	90.9	SEQ ID No 57
D34-57							***	98.9	98.3	SEQ ID No 59
D34-52								***	99.4	SEQ ID No 61
D34-25									***	SEQ ID No 63

ALIGNMENT OF GROUP 14

D177-BD7	ATTAATTTTCAATACCACTTGTTGAGCTTGCACTTGCTAATCTATTGTTTCATTATAAT	SEQ ID No 83
D177-BD5	ATTAATTTTCAATACCACTTGTTGAGCTTGCACTTGCTAATCTATTGTTTCATTATAAT *****	SEQ ID No 69
D177-BD7	TGGTCACCTCCTGAGGGGATGCTACCTAAGGATGTTGATATGGAAGAAGCTTTGGGGATT	
D177-BD5	TGGTCACCTCCTGAAGGGATGCTAGCTAAGGATGTTGATATGGAAGAAGCTTTGGGGATT *****	
D177-BD7	ACCATGCACAAGAAATCTCCCTTTGCTTAGTAGCTTCTCATTATAAATTGTTGTGA	
D177-BD5	ACCATGCACAAGAAATCTCCCTTTGCTTAGTAGCTTCTCATTATA-CTTGTGGA-- *****	

PERCENT IDENTITY OF GROUP 14

	D177-BD7	D177-BD5	
D177-BD7	***	96.0	SEQ ID No 83
D177-BD5		***	SEQ ID No 69

ALIGNMENT OF GROUP 15

D56A-AG10	ATGCAACTTGGGCTTTATGCATTGGAAATGGCTGTGGCCCATCTTCTTCATTGTTTACT	SEQ ID No 71
D58-AD12	ATGCAACTTGGGCTTTATGCATTGGAAATGGCTGTGGCCCATCTTCTTCATTGTTTACT	SEQ ID No 75
D58-BC5	ATGCAACTTGGGCTTTATGCATTAGAAATGGCAGTGGCCCATCTTCTTCTTTGCTTTACT *****	SEQ ID No 73
D56A-AG10	TGGGAATTGCCAGATGGTATGAAACCAAGTGAGCTTAAATGGATGATATTTTGGACTC	
D58-AD12	TGGGAATTGCCAGATGGTATGAAACCAAGTGAGCTTAAATGGATGATATTTTGGACTC	
D58-BC5	TGGGAATTGCCAGATGGTATGAAACCAAGTGAGCTTAAATGGATGATATTTTGGACTC *****	
D56A-AG10	ACTGCTCCAAAAGCTAATCGACTCGTGGCTGTGCCTACTCCACGTTTGTGTGTCCCCTT	
D58-AD12	ACTGCTCCAAGAGCTAATCGACTCGTGGCTGTGCCTACTCCACGTTTGTGTGTCCCCTT	
D58-BC5	ACTGCTCCAAGAGCTAATCGACTCGTGGCTGTGCCTAGTCCACGTTTGTGTGTCCCCTT *****	



**FIGURE 150: COMPARISON OF SEQUENCE GROUPS**PERCENT IDENTITY OF GROUP 17

	<u>D73A-AD</u>	<u>70A-BA11</u>	
D73A-AD6	***	99.3	SEQ ID No 89
D70A-BA11		***	SEQ ID No 91

ALIGNMENT OF GROUP 18

D70A-AB5	CAAAACTTCGCGATTTTGAAGCAAAAATGGCTATAGCTATGATTCTACAACGCTTCTCC	SEQ ID No 95
D70A-AA8	CAAAACTTCGCGATTTTGAAGCAAAAATGGCTATAGCTATGATTCTACAACGCTTCTCC *****	SEQ ID No 97
D70A-AB5	TTCGAGCTCTCCCCATCTTATACACACTCTCCATACACTGTGGTCACTTTGAAACCCAAA	
D70A-AA8	TTCGAGCTCTCTCCATCTTATACACACTCTCCATACACTGTGGTCACTTTGAAACCCAAA *****	
D70A-AB5	TATGGTGCTCCCCTAATAATGCACAGGCTGTAG	
D70A-AA8	TATGGTGCTCCCCTAATAATGCACAGGCTGTAG *****	

PERCENT IDENTITY OF GROUP 18

	<u>D70A-AB5</u>	<u>D70A-AA8</u>	
D70A-AB5	***	99.6	SEQ ID No 95
D70A-AA8		***	SEQ ID No 97

ALIGNMENT OF GROUP 19

D70A-AB8	CAAAATTTTGCCATGTTAGAAGCAAAGATGGCTCTGTCTATGATCCTGCAACGCTTCTCT	SEQ ID No 99
D70A-BH2	ATAAACTTTGCAATGACAGAAGCGAAGATGGCTATGGCTATGATTCTGCAACGCTTCTCC	SEQ ID No 101
D70A-AA4	ATAAACTTTGCAATGGCAGAAGCGAAGATGGCTATGGCTATGATTCTGCAACGCTTCTCC *** *****	SEQ ID No 103
D70A-AB8	TTTGAAGTCTCCGCTCTTATGCACATGCCCCCTCAGTCCATATTAAACCGT-CAGCCACAA	
D70A-BH2	TTTGAGCTATCTCCATCTTACACACATGCTCCACAGTCTGTAATAACTATGCAACCCCAA	
D70A-AA4	TTTGAGCTATCTCCATCTTACACACATGCTCCACAGTCTGTAATAACTATGCAACCCCAA *****	
D70A-AB8	TATGGTGCTCCACTTATTTCCACAAGCTATAA	
D70A-BH2	TATGGTGCTCCTCTTATATTGCACAAATTGTAA	
D70A-AA4	TATGGTGCTCCTCTTATATTGCACAAATTGTAA *****	

PERCENT IDENTITY OF GROUP 19

	<u>D70A-AB8</u>	<u>D70A-AA4</u>	<u>D70A-BH2</u>	
D70A-AB8	***	77.8	77.8	SEQ ID No 99
D70A-AA4		***	99.3	SEQ ID No 101
D70A-BH2			***	SEQ ID No 103

ALIGNMENT OF GROUP 20

D70A-BA1	CAAAACTTTGCAATGATGGAAGCAAAAATGGCAGTAGCTATGATACTACAAAAATTTTCC	SEQ ID No 105
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**FIGURE 150: COMPARISON OF SEQUENCE GROUPS**

D70A-BA9	CAAAACTTTGCAATGATGGAAGCAAAATGGCAGTAGCTATGATACTACATAAATTTTCC *****	SEQ ID No 107
D70A-BA1	TTTGAACATATCCCCTTCTTATACACATGCTCCATTGCAATTGTGACTATTTCATCCTCAG	
D70A-BA9	TTTGAACATATCCCCTTCTTATACACATGCTCCATTGCAATTGTGACTATTTCATCCTCAG *****	
D70A-BA1	TATGGTGCTCCTCTGCTTATGCGCAGACTTTAA	
D70A-BA9	TATGGTGCTCCTCTGCTTATGCGCAGACTTTAA *****	

**PERCENT IDENTITY OF GROUP 20**

	<u>D70A-BA1</u>	<u>D70A-BA9</u>	
D70A-BA1	***	99.4	SEQ ID No 105
D70A-BA9		***	SEQ ID No 107

**ALIGNMENT OF GROUP 22**

D144-AH1	TATAGCTTGGGGCTCAAGGAGATTCAAGCTAGCTTAGCTAATCTTCTACATGGATTTAAC	SEQ ID No 113
D34-65	CATAGCTTGGGGCTCAAGGTGATTCAAGCTAGCTTAGCTAATCTTCTACATGGATTTAAC	SEQ ID No 115
D181-AC5	TATAGCATGGGGCTCAAGGCGATTCAAGCTAGCTTAGCTAATCTTCTACATGGATTTAAC *****	SEQ ID No 111
D144-AH1	TGGTCATTGCCTGATAATATGACTCCTGAGGACCTCAACATGGATGAGATTTTGGGCTC	
D34-65	TGGTCATTGCCTGATAATATGACTCCTGAGGACCTCAACATGGATGAGATTTTGGGCTC	
D181-AC5	TGGTCATTGCCTGATAATATGACTCCTGAGGACCTCAACATGGATGAGATTTTGGGCTC *****	
D144-AH1	TCTACACCTAAAAAATTTCCACTTGCTACTGTGATTGAGCCAAGACTTTCACCAAACTT	
D34-65	TCTACACCTAAAAAATTTCCACTTGCTACTGTGATTGAGCCAAGACTTTCACCAAACTT	
D181-AC5	TCTACACCTAAAAAATTTCCACTTGCTACTGTGATTGAGCCAAGACTTTCACCAAACTT *****	
D144-AH1	TACTCTGITTGA	
D34-65	TACTCTGITTGA	
D181-AC5	TACTCTGITTGA *****	

**PERCENT IDENTITY OF GROUP 22**

	<u>D34-65</u>	<u>D181-AC5</u>	<u>D144-AH1</u>	
D34-65	***	98.4	99.0	SEQ ID No 115
D181-AC5		***	99.0	SEQ ID No 111
D144-AH1			***	SEQ ID No 113

**ALIGNMENT OF GROUP 25**

D58-AA1	TTGGGCTTGGCAACGGTGCATGTGAATTTGATGTTGGCCCGAATGATTCAAGAATTTGAA	SEQ ID No 121
D185-BC1	TTGGGCTTGGCAACGGTGCATGTGAATTTGATGTTGGCCCGAACGATTCAAGAATTTGAA	SEQ ID No 133

**FIGURE 150: COMPARISON OF SEQUENCE GROUPS**

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D185-BG2      TTGGGCTTGGCAACGGTGCATGTGAATTTGATGTTGGCCCGAATGATTCAAGAATTTGAA  SEQ ID No 135
*****

D58-AA1       TGGTCCGCTTACCCGAAAAATAGGAAAGTGGATTTTACTGAGAAATTGGAATTTACTGTG

D185-BC1      TGGTCCGCTTACCCGAAAAATAGGAAAGTGGATTTTACTGAGAAATTGGAATTTACTGTG

D185-BG2      TGGTCCGCTTACCCGAAAAATAGGAAAGTGGATTT-ACTGAGAAATTGGAATTTACTGTG
*****

D58-AA1       GTGATGAAAAATCCTTTAAGAGCTAAGGTCAAGCCAAGAATGCAAGTGGTGTA
|
D185-BC1      GTGATGAAAAACCTTTAAGAGCTAAGGTCAAGCCAAGAATGCAAGTGGTGTA
|||
D185-BG2      GTGA-----
****

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**PERCENT IDENTITY OF GROUP 25**

	<u>D58-AA1</u>	<u>D185-BG2</u>	<u>D185-BC1</u>	
D58-AA1	***	95.9	98.9	SEQ ID No 121
D185-BG2		***	95.1	SEQ ID No 135
D185-BC1			***	SEQ ID No 133

**ALIGNMENT OF GROUP 28**

```

D177-BF7      ATCACATTTGCTAAGTTTGTGAATGAGCTAGCATTGGCAAGATTAATGTTCCATTTTGAT  SEQ ID No 127
D185-BD2      ATCACATTTGCTAAGTTTGTGAATGAGCTAGCATTGGCAAGATTAATGTTCCATTTTGAT  SEQ ID No 139
D185-BE1      ATCACATTTGCTAAGTTTGTGAATGAGCTAGCATTGGCAAGATTAATGTTCCATTTTGAT  SEQ ID No 137
*****

D177-BF7      TTCTCGCTACCAAAGGAGTTAAGCATGAGGATTTGGACGTGGAGGAAGCTGCTGGAATT
|
D185-BD2      TTCTCGCTACCAAAGGAGTTAAGCATGCGGATTTGGACGTGGAGGAAGCTGCTGGAATT
|
D185-BE1      TTCTCGCTACCAAAGGAGTTAAGCATGAGGATTTGGACGTGGAGGAAGCTGCTGGAATT
*****

D177-BF7      ACTGTTAGAAGGAAGTTCCTCCCTTTTAGCCGTCGCCACTCCATGCTCGTGA
D185-BD2      ACTGTTAGAAGGAAGTTCCTCCCTTTTAGCCGTCGCCACTCCATGCTCGTGA
|
D185-BE1      ACTGTTAGGAGGAAGTTCCTCCCTTTTAGCCGTCGCCACTCCATGCTCGTGA
*****

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**PERCENT IDENTITY OF GROUP 28**

	<u>D177-BF7</u>	<u>D185-BD2</u>	<u>D185-BE1</u>	
D177-BF7	***	99.4	99.4	SEQ ID No 127
D185-BD2		***	98.8	SEQ ID No 139
D185-BE1			***	SEQ ID No 137

**ALIGNMENT OF GROUP 30**

```

D70A-AA12     ATGTCATTTGGTTTAGCTAATCTTTACTTACCATTGGCTCAATTACTCTATCACTTTGAC  SEQ ID No 131
|
D176-BF2      ATATCATTTGGTTTGGCTAATGTTTATTGGCCACTAGCTCAATTGTTATATCATTTTGAT  SEQ ID No 85

```

**FIGURE 150: COMPARISON OF SEQUENCE GROUPS**

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** *****
D70A-AA12      TGGAAACTCCCAACCGGAATCAAGCCAAGAGACTTGGACTTGACCGAATTATCGGGAATA
                | | | | | | | | | | | | | | | | | | | | | | | | | | | |
D176-BF2      TGGAAACTCCCTACTGGAATCAATTCAAGTGACTTGGACATGACTGAGTCGTCAGGAGTA
                ***** ** ***** ** * * * * *
D70A-AA12      ACTATTGCTAGAAAGGGTGACCTTTACTTAAATGCTACTCCTTATCAACCTTCTCGAGAGTAA
                | | | | | | | | | | | | | | | | | | | | | | | | | | | |
D176-BF2      ACTTGTGCTAGAAAGAGTGATTTATACTTGACTGCTACTCCATATCAACTTTCTCAAGAGTGA
                *** ***** ** * * * * *

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PERCENT IDENTITY OF GROUP 30

	<u>D176-BF2</u>	<u>D70A-AA12</u>	
D176-BF2	***	77.0	SEQ ID No 85
D70A-AA12		***	SEQ ID No 131

<b>GROUP 1</b>	<b>ExxRxxP</b>	<b>FxPERF</b>	<b>Gx RxC</b>	
D208-AD9 98.8	EVLRLYPGP LLVPHEVND CUVSGYHIPK GTRLFANVMK LQRPDKLMSD PDTFDPERFI ATDIDFRGOY KYIIPFGGR RSC SEQ.	PDTFDPERFI	ATDIDFRGOY KYIIPFGGR RSC SEQ.	ID. No. 297
D120-AH4 97.6	EVLRLYPGP LLVPHEVND CUVSGYHIPK GTRLFANVMK LLRDPKLWPD PDTFDPERFI ATDIDFRGOY KYIIPFGSR RSC SEQ.	PDTFDPERFI	ATDIDFRGOY KYIIPFGSR RSC SEQ.	ID. No. 298
D121-AA8 91.6	EVLRLYPGP LLVPHEVND CUVSGYHIPK GTRLFANVMK LQRPDKLMSD PDTFDPERFI ATDIDFRGOY KYIIPFGSR RSC SEQ.	PDTFDPERFI	ATDIDFRGOY KYIIPFGSR RSC SEQ.	ID. No. 299
D122-AF10 91.6	EVLRLYPGP LLVPHEVND CUVSGYHIPK GTRLFANVMK LQRPDKLSN PKDFDPERFF ADDIDYRGHH YEFIPFGSR RSC SEQ.	PKDFDPERFF	ADDIDYRGHH YEFIPFGSR RSC SEQ.	ID. No. 3
D103-AH3 98.8	KVLRLYPPGP LLVPHEVND CUVSGYHIPK GTRLFANVMK LQRPDKLSN PKDFDPERFI AGDIDFRGHH YEFIPFGSR RSC SEQ.	PKDFDPERFI	AGDIDFRGHH YEFIPFGSR RSC SEQ.	ID. No. 30
D208-AC8 98.8	KVLRLYPPGP LLVPHEVND CUVSGYHIPK GTRLFANVMK LQRPDKLSN PKDFDPERFI AGDIDFRGHH YEFIPFGSR RSC SEQ.	PKDFDPERFI	AGDIDFRGHH YEFIPFGSR RSC SEQ.	ID. No. 302
D235-AB1	KVLRLYPPGP LLVPHEVND CUVSGYHIPK GTRLFANVMK LQRPDKLSN PKDFDPERFI AGDIDFRGHH YEFIPFGSR RSC SEQ.	PKDFDPERFI	AGDIDFRGHH YEFIPFGSR RSC SEQ.	ID. No. 303
<b>GROUP 2</b>	<b>ExxRxxP</b>	<b>FxPERF</b>	<b>GxRxC</b>	
D244-AD4 100.0	ETLRLYPPVP FLPLPEAVQD CKVTGYHIPK GTRLYINAWK VHRDPEIWSE PEKFMNRF L TSKANIDARG QNFEEIPFGS GRRSC SEQ.	PEKFMNRF L	TSKANIDARG QNFEEIPFGS GRRSC SEQ.	ID. No. 304
D244-AB6 98.8	ETLRLYPPVP FLPLPEAVQD CKVTGYHIPK GTRLYINAWK VHRDPEIWSE PEKFMNRF L TSKANIDARG QNFEEIPFGS GRRSC SEQ.	PEKFMNRF L	TSKANIDARG QNFEEIPFGS GRRSC SEQ.	ID. No. 305
D285-AA8 100.0	ETLRLFPPVP FLPLPEAVQD CKVTGYHIPK GTRLYINAWK VHRDPEIWSE PEKFMNRF L TSKANIDARG QNFEEIPFGS GRRSC SEQ.	PEKFMNRF L	TSKANIDARG QNFEEIPFGS GRRSC SEQ.	ID. No. 306
D285-AB9 97.6	ETLRLFPPVP FLPLPEAVQD CKVTGYHIPK GTRLYINAWK VHRDPEIWSE PEKFMNRF L TSKANIDARG QNFEEIPFGS GRRSC SEQ.	PEKFMNRF L	TSKANIDARG QNFEEIPFGS GRRSC SEQ.	ID. No. 307
D268-AE2	ETLRLYPPVP FLPLPEAVQD CKVTGYHIPK GTRLYINAWK VHRDPEIWSE PEKFMNRF L TSKANIDARG QNFEEIPFGS GRRSC SEQ.	PEKFMNRF L	TSKANIDARG QNFEEIPFGS GRRSC SEQ.	ID. No. 3
<b>GROUP 3</b>	<b>ExxRxxP</b>	<b>FxPERF</b>	<b>GxRx C</b>	
D100A-AC3 97.6	ETRMYPAGE LLVPHESEE TTVGGRVPG GTMLLVNLWA IHNDPKLWDE PRKFKEPERFE GLEGVRDGKY MDPFGSRRS C SEQ.	PRKFKEPERFE	GLEGVRDGKY MDPFGSRRS C SEQ.	ID. No. 309
D100A-BE2	ETRMYPAGE LLVPHESEE TTVGGRVPG GTMLLVNLWA IHNDPKLWDE PRKFKEPERFO GLDGVRDGKY MDPFGSRRS C SEQ.	PRKFKEPERFO	GLDGVRDGKY MDPFGSRRS C SEQ.	ID. No. 310

FIGURE 151B: Alignment of Full Length Clones

GROUP 4	ExxRxxP	FxPERF		Gx RxC
D205-BG9 100.0	ETMRLYTPIP	LLLPHYSTKD	CIVEGYDVPK HTMLFNANA IHRDPKVWEE PDKFKPERFE ATEGETERFN YKLVPFGMGR RAC SEQ.	ID. No. 311
D205-BE9 100.0	ETMRLYTPIP	LLLPHYSTKD	CIVEGYDVPK HTMLFNANA IHRDPKVWEE PDKFKPERFE ATEGETERFN YKLVPFGMGR RAC SEQ.	ID. No. 312
D205-AH4	ETMRLYTPIP	LLLPHYSTKD	CIVEGYDVPK HTMLFNANA IHRDPKVWEE PDKFKPERFE ATEGETERFN YKLVPFGMGR RAC SEQ.	ID. No. 313
GROUP 5	ExxRxxP	FxPERF	Gx RxC	
D259-AB9 100.0	ETMRLHPVAP	MLVPRECRE	IKVAGYDVQK GTRVLVSVNT IGRDPTLWDE PEVFKPERFH EKSIDVKGHD YELLPPFGAGR RMC SEQ.	ID. No. 314
D257-AE4 98.8	ETMRLHPVAP	MLVPRECRE	IKVAGYDVQK GTRVLVSVNT IGRDPTLWDE PEVFKPERFH EKSIDVKGHD YELLPPFGAGR RMC SEQ.	ID. No. 315
D147-AD3	ETMRLHPVAP	MLVPRECRE	IKVAGYDVQK GTRVLVSVNT IGRDPTLWDE PEVFKPERFH ERSIDVKGHD YELLPPFGAGR RMC SEQ.	ID. No. 316
GROUP 6	ExxRxxP	FxPERF	Gx RxC	
D249-AEB 98.8	EALRLHPPTP	LMLPHRASAS	VKIGGYDIPK GSIHVNVNA VARDPAVWKN PLEFRPERFL EEDVDMKGHD YRLPPFGAGR RVC SEQ.	ID. No. 317
D248-AA6	EALRLHPPTP	LMLPKASAS	VKIGGYDIPK GSIHVNVNA VARDPAVWKN PLEFRPERFL EEDVDMKGHD YRLPPFGAGR RVC SEQ.	ID. No. 318
GROUP 7	ExxRxxP	FxPERF	Gx RxC	
D233-AG7 98.8	ETLRLHPLGT	MLAPHCAIED	CNVAGYDIQK GTTFLVNVNT IGRDPKYWDR AQEFLPERFL ENDIDMDGHN FAFLPFGSGR RRC SEQ.	ID. No. 3
D224-BD11 100.0	ETLRLHPLGT	MLAPHCAIED	CNVAGYDIQK GTTFLVNVNT IGRDPKYWDR AQEFLPERFL ENDIDMDGHN FAFLPFGSGR RRC SEQ.	ID. No. 320
D224-AF10	ETLRLHPLGT	MLAPHCAIED	CNVAGYDIQK GTTFLVNVNT IGRDPKYWDR AQEFLPERFL ENDIDMDGHN FAFLPFGSGR RRC SEQ.	ID. No. 321
GROUP 8	ExxRxxP	FxPERF	Gx RxC	
D105-AD6 100.0	EVLRLYPAGY	VINRMVNKET	KLGNLCLPAG VQLVLPMTLL QHDTIENGDD AMEENPERFS DGISKATGK LVFFPFSWGP RIC SEQ.	ID. No. 322
D215-AB5 95.2	EVLRLYPAGY	VINRMVNKET	KLGNLCLPAG VQLVLPMTLL QHDTIENGDD AMEENPERFS DGISKATGK LVFFPFSWGP RIC SEQ.	ID. No. 323
D135-AE1	EVLRLYPAGY	AINRMVTKET	KLGNLCLPAG VQLLLPTILL QHDTIENGDD AMEENPERFS DGISKATGK LVFFPFSWGP RIC SEQ.	ID. No. 324

FIGURE 151c: Alignment of Full Length Clones

GROUP 9		ExxRxxP		FxPERF	Gx RxC	ID. No.
D87A-AB3	100.0	ESLRLYPPPIA	TRTRTNEET	KLGEIDLPGK	ALLFIPTILL	HLDKEIWGED ADEFNPERFS EGVAKATGK MTYFPFGAGP RKC SEQ. ID. No. 325
D210-BD4		ESLRLYPPPIA	TRTRTNEET	KLGEIDLPGK	ALLFIPTILL	HLDRKINGED ADEFNPERFS EGVAKATGK MTYFPFGAGP RKC SEQ. ID. No. 326
GROUP 10		ExxRxxP		FxPERF	Gx RxC	ID. No.
D89-AB1	100.0	ETLRMHPPPI	LLVPRECMED	TKIDGYNIPF	KTRVIVNAWA	IGRDPESWDD PESFNPERFE NSSIDFLGNH HQFIPFGAGR RIC SEQ. ID. No. 327
D89-AD2	100.0	ETLRMHPPPI	LLVPRECMED	TKIDGYNIPF	KTRVIVNAWA	IGRDPESWDD PESFNPERFE NSSIDFLGNH HQFIPFGAGR RIC SEQ. ID. No. 328
D163-AG12	98.8	ETLRMHPPPI	LLVPRECMED	TKIDGYNIPF	KTRVIVNAWA	IGRDPESWDD PESFNPERFE NSSIDFLGNH HQFIPFGAGR RIC SEQ. ID. No. 339
D163-AG11	100.0	ETLRMHPPPI	LLVPRECMED	TKIDGYNIPF	KTRVIVNAWA	IGRDPQSWDD PESFTPERFE NNSIDFLGNH HQFIPFGAGR RIC SEQ. ID. No. 330
D163-AF12		ETLRMHPPPI	LLVPRECMED	TKIDGYNIPF	KTRVIVNAWA	IGRDPQSWDD PESFTPERFE NNSIDFLGNH HQFIPFGAGR RIC SEQ. ID. No. 331
GROUP 11		ExxRxxP		FxPERF	Gx RxC	ID. No.
D267-AF10	100.0	ETLRMHPPVP	LLGPRECRDQ	TEIDGYTVPI	KARVMVNAWA	IGRDPESWED PESFKPERFE NTSVDLTGNH YQFIPFGSGR RMC SEQ. ID. No. 332
D96-AC2	100.0	ETLRMHPPVP	LLGPRECRDQ	TEIDGYTVPI	KARVMVNAWA	IGRDPESWED PESFKPERFE NTSVDLTGNH YQFIPFGSGR RMC SEQ. ID. No. 333
D96-AB6	96.4	ETLRMHPPVP	LLGPRECRDQ	TEIDGYTVPI	KARVMVNAWA	IGRDPESWED PESFKPERFE NTSVDLTGNH YQFIPFGSGR RMC SEQ. ID. No. 334
D207-AA5	100.0	ETLRMHPPVP	LLGPRECREQ	TEIDGYTVPL	KARVMVNAWA	IGRDPESWED PESFKPERFE NISVDLTGNH YQFIPFGSGR RMC SEQ. ID. No. 335
D207-AB4	100.0	ETLRMHPPVP	LLGPRECREQ	TEIDGYTVPL	KARVMVNAWA	IGRDPESWED PESFKPERFE NISVDLTGNH YQFIPFGSGR RMC SEQ. ID. No. 336
D207-AC4		ETLRMHPPVP	LLGPRECREQ	TEIDGYTVPL	KARVMVNAWA	IGRDPESWED PESFKPERFE NISVDLTGNH YQFIPFGSGR RMC SEQ. ID. No. 337
GROUP 12		ExxRxxP		FxPERF	Gx RxC	ID. No.
D98-AG1	100.0	ETLRMHPPTP	LLVPRECREE	TEIEGFTIPL	KSKVLNVNWA	IGRDPENWKN PECFTPERFE NSSIEFTGNH FQLLPFGAGR RIC SEQ. ID. No. 338
D98-AA1		ETLRMHPPTP	LLVPRECREE	TEIEGFTIPL	KSKVLNVNWA	IGRDPENWKN PECFTPERFE NSSIEFTGNH FQLLPFGAGR RIC SEQ. ID. No. 339

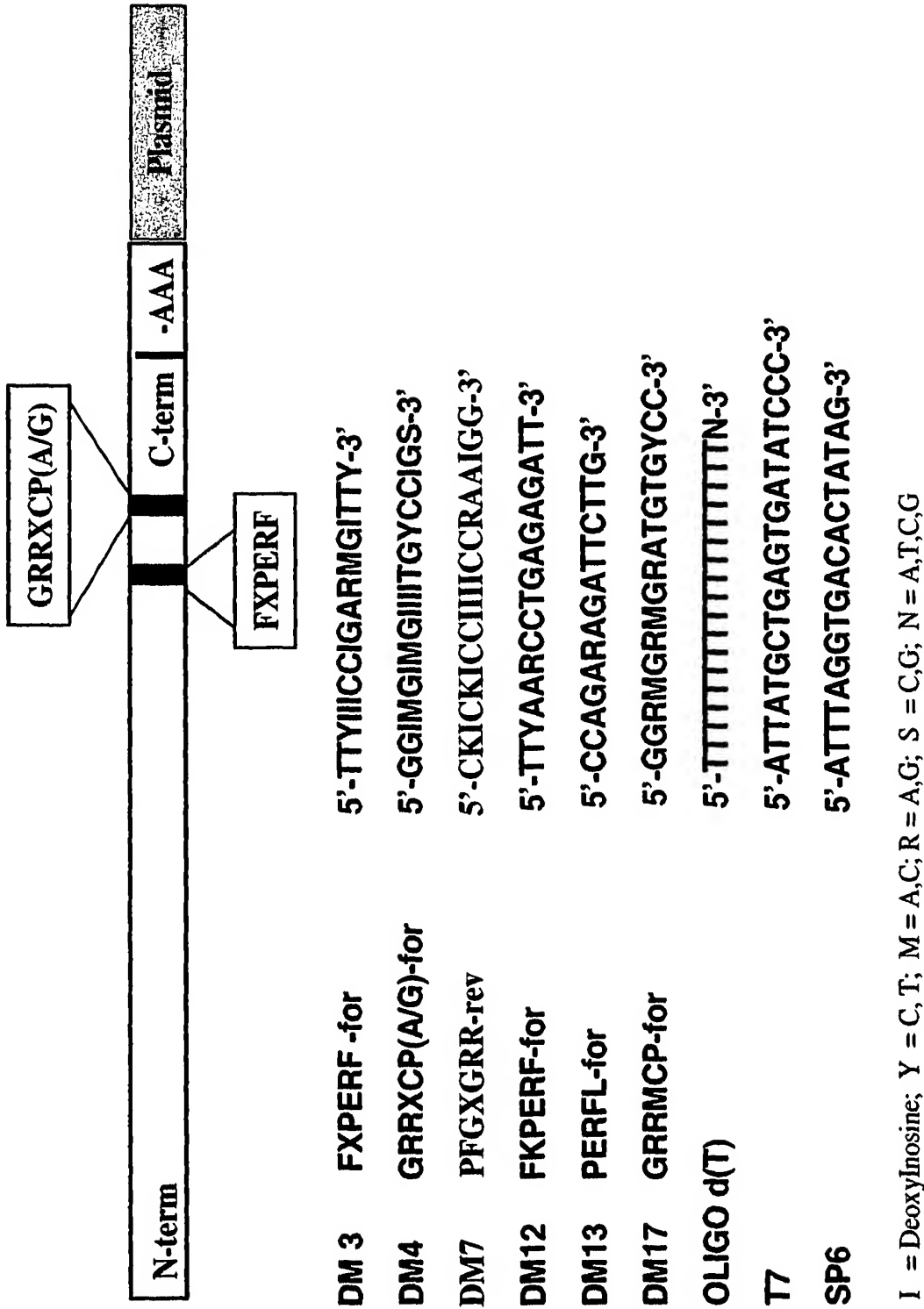
FIGURE 151D: Alignment of Full Length Clones

GROUP 13		ExxRxxP		Tningytipv		Ktkvmvnvwa		Lgrdpkywnd		FxPERF		Gx RxC	
D209-AA10	100.0	ETLRLHPPVP	LLLLPRECREE	TNINGYTIPV	TKTKVMNVNWA	LGRDPKYWND	AETFMPEPFE	QCSKDFVGNN	FEYLPFGGGR	RIC SEQ.	ID. No. 340		
D209-AA12	100.0	ETLRLHPPVP	LLLLPRECREE	TNINGYTIPV	TKTKVMNVNWA	LGRDPKYWND	AETFMPEPFE	QCSKDFVGNN	FEYLPFGGGR	RIC SEQ.	ID. No. 341		
D209-AH10	100.0	ETLRLHPPVP	LLLLPRECREE	TNINGYTIPV	TKTKVMNVNWA	LGRDPKYWND	AETFMPEPFE	QCSKDFVGNN	FEYLPFGGGR	RIC SEQ.	ID. No. 3		
D209-AH12	97.6	ETLRLHPPVP	LLLLPRECREE	TNINGYTIPV	TKTKVMNVNWA	LGRDPKYWND	AETFMPEPFE	QCSKDFVGNN	FEYLPFGGGR	RIC SEQ.	ID. No. 34		
D90a-BB3		ETLRLHPPVP	LLLLPRECREE	TNINGYTIPV	TKTKVMNVNWA	LGRDPKYWDD	AETFKPERFE	QCSKDFVGNN	FEYLPFGGGR	RIC SEQ.	ID. No. 344		
GROUP 14		ExxRxxP		TVsgyhipak		Shviinsfai		GRDKNSWEDP		ETyKPSRFLK		Gx RxC	
D129-AD10	100.0	ETLRLHPPIP	LLLHETAEES	TVSGYHIPAK	SHVIINSFAI	GRDKNSWEDP	ETYKPSRFLK	EGVPDFKGGN	FEFIPFGSGR	RSC SEQ.	ID. No. 345		
D104A-AE8		ETLRLHPPIP	LLLHETAEES	TVSGYHIPAK	SHVIINSFAI	GRDKNSWEDP	ETYKPSRFLK	EGVPDFKGGN	FEFIPFGSGR	RSC SEQ.	ID. No. 346		
GROUP 15		ExxRxxP		Tilegyeirp		Rtivhvnawa		Iardpeiwen		PDefiPerFL		Gx RxC	
D228-AH8	100.0	EIFRLYPPAP	LLVPRESMEK	TILEGYEIRP	RTIVHVNAWA	IARDPEIWEN	PDEFIPERFL	NSSIDYKGQD	FELLPPGAGR	RGC SEQ.	ID. No. 347		
D228-AD7	100.0	EIFRLYPPAP	LLVPRESMEK	TILEGYEIRP	RTIVHVNAWA	IARDPEIWEN	PDEFIPERFL	NSSIDYKGQD	FELLPPGAGR	RGC SEQ.	ID. No. 348		
D250-AC11	100.0	EIFRLYPPAP	LLVPRESMEK	TILEGYEIRP	RTIVHVNAWA	IARDPEIWEN	PDEFIPERFL	NSSIDYKGQD	FELLPPGAGR	RGC SEQ.	ID. No. 3		
D247-AH1		EIFRLYPPAP	LLVPRESMEK	TILEGYEIRP	RTIVHVNAWA	IARDPEIWEN	PDEFIPERFL	NSSTDYKGQD	FELLPPGAGR	RGC SEQ.	ID. No. 350		
GROUP 16		ExxRxxP		AKlggfdipa		Eskilvnaww		Lannpahwkk		PeeFRPERFF		GxRxC	
D128-AB7	98.8	EALRLRMAIP	LLVPHMNLHD	AKLGGFDIPA	ESKILVNAWW	LANNPAHWKK	PEEFRPERFF	EEEKHVEANG	NDFRYLPFGV	GRRSC SEQ.	ID. No. 35		
D243-AA2	97.7	EALRLRMAIP	LLVPHMNLHD	AKLGGLDIPA	ESKILVNAWW	LANNPAHWKK	PEEFRPERFF	EEEKHVEANG	NDFRYLPFGV	GRRSC SEQ.	ID. No. 35		
D125-AF11		ETLRLRMAIP	LLVPHMNLHD	AKLGGFDIPA	ESKILVNAWW	LANNPAHWKK	PEEFRPERFF	EEEKHVEANG	NDFRYLPFGV	GRRSC SEQ.	ID. No. 35		

FIGURE 151E: Alignment of Full Length Clones

GROUP 17	ExxRxxP	FxPERF	Gx RxC
D284-AH5	ESLRLYSPVV SLIRRPNEDA ILGNVSLPEG VLLSLPVILL HHDEEIWGKD	-KKENPERFR DGVSSATKGQ	VTFPPFTWGP RIC SEQ. ID. No. 354
86.7			
D110-AF12	ESLRLYPPVV TLTRRPKEDT VLGDVSLPAG VLISLPVILL HHDEEIWGKD	AKKEKPERFR DGVSSATKGQ	VTFPPFTWGP RIC SEQ. ID. No. 355

Figure 152: Cloning of cytochrome P450 cDNA fragments by PCR



**FIG. 153**

NAME D425-AB10  
 ORGANISM NICOTIANA TABACUM  
 SEQ ID 356

```

1  ATGCTTTTCTC CCATAGAAGC CATTGTAGGA CTAGTAACCT TCACATTTCT CTTCTTCTTC
61 CTATGGACAA AAAAATCTCA AAAACCTTCA AAACCCCTTAC CACCGAAAAT CCCC GGAGGA
121 TGGCCGGTAA TCGGCCATCT TTTCCACTTC AATGACGACG GCGACGACCG TCCATTAGCT
181 CGAAAACTCG GAGACTTAGC TGACAAATAC GGCCCCGTTT TCACTTTTCG GCTAGGCCTT
241 CCCCTTGTCT TAGTTGTAAG CAGTTACGAA GCTGTAAAAG ACTGTTTCTC TACAAATGAC
301 GCCATTTTTC CCAATCGTCC AGCTTTTCTT TACGGCGATT ACCTTGGCTA CAATAATGCC
361 ATGCTATTTT TGGCCAATTA CGGACCTTAC TGGCGAAAAA ATCGAAAAAT AGTTATTTCAG
421 GAAGTTCTCT CCGCTAGTCG TCTCGAAAAA TTCAAACACG TGAGATTTGC AAGAATTCAA
481 GCGAGCATTA AGAATTTATA TACTCGAATT GATGGAAATT CGAGTACGAT AAATTTAACT
541 GATTGGTTAG AAGAATTGAA TTTTGGTCTG ATCGTGAAGA TGATCGCTGA AAAAAATTAT
601 GAATCCGGTA AAGGAGATGA ACAATTGGAG AGATTTAAGA AAGCGTTTAA GGATTTTATG
661 ATTTTATCAA TGGAGTTTGT GTTATGGGAT GCATTTCCAA TTCCATTATT TAAATGGGTG
721 GATTTTCAAG GGCATGTAA GGCTATGAAA AGGACTTTTA AAGATATAGA TTCTGTTTTT
781 CAGAATTGGT TAGAGGAACA TATTAATAAA AGAGAAAAAA TGGAGGTAA TGCAGAAGGG
841 AATGAACAAG ATTTTCATTGA TGTGGTGCTT TCAAAAATGA GTAATGAATA TCTTGGTGAA
901 GGTTACTCTC GTGATACTGT CATTAAAGCA ACGGTGTTTA GTTTGGTCTT GGATGCAGCA
961 GACACAGTTG CTCTTCACAT AAATTGGGGA ATGGCATTAT TGATAAACAA TCAAAAGGCC
1021 TTGACGAAAG CACAAGAAGA GATAGACACA AAAGTTGGTA AGGACAGATG GGTAGAAGAG
1081 AGTGATATTA AGGATTTGGT ATACCTCCAA GCTATTGTTA AAGAAGTGT ACGATTATAT
1141 CCACCAGGAC CTTTGTTAGT ACCACACGAA AATGTAGAAG ATTGTGTTGT TAGTGGATAT
1201 CACATTCCTA AAGGGACAAG ATTATTCGCA AACGTCATGA AACTGCAACG TGATCCTAAA
1261 CTCTGGTCTG ATCCTGATAC TTTGATCCA GAGAGATTCA TTGCTACTGA TATTGACTTT
1321 CGTGGTCAGT ACTATAAGTA TATCCCGTTT GGTCTGGA GACGATCTTG TCCAGGGATG
1381 ACTTATGCAT TGCAAGTGGA ACACTTAACA ATGGCACATT TGATCCAAGG TTTCAATTAC
1441 AGAACTCCAA ATGACGAGCC CTTGGATATG AAGGAAGGTG CAGGCATAAC TATACGTAAG
1501 GTAAATCCTG TGGAAGTGAT AATAGCGCCT CGCCTGGCAC CTGAGCTTTA TTAAAACCTA
1561 AGATCATCTT GCT

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**SEQ ID 357**

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1  MLSPIEAIVG LVTFTFLFFF LWTKKSQKPS KPLPPKIPGG WPVIGHLFHF NDDGDDRPLA
61 RKLGLDLADKY GPVFTFRLGL PLVLVSSYE AVKDCFSTND AIFSNRPAFL YGDYLGYNNA
121 MLFLANYGPY WRKNRKLVIQ EVLSASRLEK FKHVRFARIQ ASIKNLYTRI DGNSSTINLT
181 DWLEELNFGL IVKMIAEKNY ESGKGDEQLE RFKKAFKDFM ILSMEFVLWD AFPIPLFKWV
241 DFQGHVKAMK RTFKDIDSVF QNWLEEHINK REKMEVNAEG NEQDFIDVVL SKMSNEYLGE
301 GYSRDTVIKA TVFSLVLDAA DTVALHINWG MALLINNQKA LTKAQEEIDT KVGKDRWVEE
361 SDIKDLVYLQ AIVKEVLRLY PPGPLVPHE NVEDCVVSGY HIPKGTRLFA NVMKLQRDPK
421 LWSDPDTFDP ERFIATDIDF RGQYYKYIPF GSRRRSCPGM TYALQVEHLT MAHLIQGFNY
481 RTPNDEPLDM KEGAGITIRK VNPVELIIP RLAPELY

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**FIG. 154**

NAME D425-AB11  
 ORGANISM NICOTIANA TABACUM  
 SEQ ID 358

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1 ATGCTTTCTC CCATAGAAAGC CATTGTAGGA CTAGTAACCT TCACATTTCT CTTCTTCTTC
61 CTATGGACAA AAAAATCTCA AAAACCTTCA AAACCCTTAC CACCGAAAAT CCCC GGAGGA
121 TGGCCGGTAA TCGGCCATCT TTTCCACTTC AATGACGACG GCGACGACCG TCCATTAGCT
181 CGAAACTCG GAGACTTAGC TGACAAATAC GGCCCCGTTT TCACTTTTTCG GCTAGGCCTT
241 CCCCTTGTCT TAGTTGTAAG CAGTTACGAA GCTGTAAAAG ACTGTTTCTC TACAAATGAC
301 GCCATTTTTT CCAATCGTCC AGCTTTTCTT TACGGCAATT ACCTTGGCTA CAATAATGCC
361 ATGCTATTTT TGGCCAATTA CGGACCTTAC TGGCGAAAAA ATCGAAAATT AGTTATTCAG
421 GAAGTTCTCT CCGCTAGTCG TCTCGAAAAA TTCAAACACG TGAGATTTGC AAGAATTCAA
481 GCGAGCATT AAGAATTGAA TTTTGGTCTG ATCGTGAAGA TGATCGCTGG AAAAAATTAT
541 GATTGGTTAG AAGAATTGAA TTTTGGTCTG ATCGTGAAGA TGATCGCTGG AAAAAATTAT
601 GAATCCGGTA AAGGAGATGA ACAAGTGGAG AGATTTAAGA AAGCGTTTAA GGATCTTATG
661 ATTTTATCAA TGGAGTTTGT GTTATGGGAT GCATTTCCAA TTCCATTATT TAAATGGGTG
721 GATTTTCAAG GGCATGTTAA GGCTATGAAA AGGACTTTTA AAGATATAGA TTCTGTTTTT
781 CAGAATTGGT TAGAGGAACA TATTAATAAA AGAGAAAAAA TGGAGGTAA TGCAGAAGGG
841 AATGAACAAG ATTTCAATTGA TGTGGTGCTT TCAAAAATGA GTAATGAATA TCTTGGTGAA
901 GGTTACTCTC GTGATACTGT CATTAAAGCA ACGGTGTTTA GTTTGGTCTT GGATGCAGCA
961 GACACAGTTG CTCTTCACAT AAATTGGGGA ATGGCATTAT TGATAAACAA TCAAAGGCC
1021 TTGACGAAAG CACAAGAAGA GATAGACACA AAAGTTGGTA AGGACAGATG GGTAGAAGAG
1081 AGTGATATTA AGGATTTGGT ATACCTCCAA GCTATTGTTA AAGAAGTGTT ACGATTATAT
1141 CCACCAGGAC CTTTGTTAGT ACCACACGAA AATGTAGAAG ATTGTTGTTG TAGGGGATAT
1201 CACATTCCTA AAGGGACAAG ATTATTCGCA AACGTCATGA AACTGCAACG TGATCCTAAA
1261 CTCTGGTCTG ATCCTGATAC TTTGATCCA GAGAGATTCA TTGCTACTGA TATTGACTTT
1321 CGTGGTCAGT ACTATAAGTA TATCCCGTTT GGTTCTGGAA GACGATCTTG TCCAGGGATG
1381 ACTTATGCAT TGCAAGTGGA AACTTAACA ATGGCACATT TGATCCAAGG TTTCAATTAC
1441 AGAACTCCAA ATGACGAGCC CTTGGATATG AAGGAAGGTG CAGGCATAAC TATACGTAAG
1501 GTAAATCCTG TGGAACTGAT AATAGCGCCT CGCCTGGCAC CTGAGCTTTA TTTAAACCTA
1561 AGATCATCTT GCT

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**SEQ ID 359**

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1 MLSPIEAIVG LVTFTFLFFF LWTKKSQKPS KPLPPKIPGG WPVIGHLFHF NDDGDDRPLA
61 RKLGDLDKY GPVFTFRLGL PLVLVSSYE AVKDCFSTND AIFS NRPAFL YGNYLGYNNA
121 MLFLANYGPY WRKNRKLVIQ EVLSASLEK FKHVRFARIQ ASIKNLYTRI DGNSSTINLT
181 DWLEELNFGI IVKMIAGKNY ESGKGDEQVE RFKKAFKDLI ILSMEFVLWD AFPIPLFKWV
241 DFQGHVKAMK RTFKDIDSVF QNWLEEHINK REKMEVNAEG NEQDFIDVVL SKMSNEYLGE
301 GYSRDTVIKA TVFSLVLDAA DTVALHINWG MALLINNQKA LTKAQEEIDT KVGKDRWVEE
361 SDIKDLVYLQ AIVKEVLRLY PPGPLLVPHE NVEDCVVRGY HIPKGTRLF NVMKLQRDPK
421 LWSDPDTFDP ERFIATDIDF RGQYYKIYIF GSGRRSCPGM TYALQVEHLT MAHLIQGFNY
481 RTPNDEPLDM KEGAGITIRK VNPVELIAP RLAPELY

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**FIG. 155**

NAME D425-AC9  
 ORGANISM NICOTIANA TABACUM  
 SEQ ID 360

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1  ATGCTTTTCTC CCATAGAAGC CATTGTAGGA CTAGTAACCT TCACATTTCT CTTCTTCTTC
61 CTATGGACAA AAAAATCTCA AAAACCTTCA AAACCCTTAC CACCGAAAAT CCCC GGAGGA
121 TGGCCGGTAA TCGGCCATCT TTTCCACTTC AATGACGACG GCGACGACCG TCCATTAGCT
181 CGAAACTCG GAGACTTAGC TGACAAATAC GGCCCCGTTT TCACTTTTCG GCTAGGCCTT
241 CCCCTTGTCT TAGTTGTAAG CAGTTACGAA GCTGTAAAAG ACTGTTTCTC TACAAATGAC
301 GCCATTTTTT CCAATCGTCC AGCTTTTCTT TACGGCGATT ACCTTGGCTA CAATAATGCC
361 ATGCTATTTT TGGCCAATTA CGGACCTTAC TGGCGAAAAA ATCGAAAATT AGTTATTGAG
421 GAAGTTCTCT CCGCTAGTCG TCTCGAAAAA TTCAAAACACG TGAGATTTGC AAGAATTCAA
481 GCGAGCATTA AGAATTTATA TACTCGAATT GATGGAAATT CGAGTACGAT AAATTTAACT
541 GATTGGTTAG AAGAATTGAA TTTTGGTCTG ATCGTGAAGA TGATCGCTGG AAAAAATTAT
601 GAATCCGGTA AAGGAGATGA ACAAGTGGAG AGATTTAAGA AAGCGTTTAA GGATTTTATG
661 ATTTTATCAA TGGAGTTTGT GTTATGGGAT GCATTTCCAA TTCCATTATT TAAATGGGTG
721 GATTTTCAAG GGCATGTTAA GGCTATGAAA AGGACTTTTA AAGATATAGA TTCTGTTTTT
781 CAGAATTGGT TAGAGGAACA TATTAATAAA AGAGAAAAAA TGGAGGTTAA TGCAGAAGGG
841 AATGAACAAG ATTTCAATTGA TGTGGTGCTT TCAAAAATGA GTAATGAATA TCTTGGTGAA
901 GGTACTCTC GTGATACTGT CATTAAAGCA ACGGTGTTTA GTTGGTCTT GGATGCAGCA
961 GACACAGTTG CTCTTCACAT AAATTGGGGA ATGGCATTAT TGATAAACAA TCAAAAGGCC
1021 TTGACGAAAAG CACAAGAAGA GATAGACACA AAAGTTGGTA AGGACAGATG GGTAGAAGAG
1081 AGTGATATTA AGGATTTGGT ATACCTCCAA GCTATTGTTA AAGAAGTGTT ACGATTATAT
1141 CCACCAGGAC CTTTGTTAGT ACCACACGAA AATGTAGAAG ATTGTGTTGT TAGTGGATAT
1201 CACATTCCTA AAGGGACAAG ATTATTGCGA AACGTCGTGA AACTGCAACG TGATCCTAAA
1261 CTCTGGTCTG ATCCTGATAC TTTGATCCA GAGAGATTCA TTGCTACTGA TATTGACTTT
1321 CGTGGTCAGT ACTATAAGTA TATCCCGTTT GGTCTCGGAA GACGATCTTG TCCAGGGATG
1381 ACTTATGCAT TGCAAGTGGA ACACTTAACA ATGGCACATT TGATCCAAGG TTTCAATTAC
1441 AGAACTCCAA ATGACGAGCC CTTGGATATG AAGGAAGGTG CAGGCATAAC TATACGTAAG
1501 GTAAATCCTG TGGAACTGAT AATAGCGCCT CGCCTGGCAC CTGAGCTTTA TTAAAACCTA
1561 AGATCATCTT GCT

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**SEQ ID 361**

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1  MLSPIEAIVG LVTFTFLFFF LWTKKSQKPS KPLPPKIPGG WPVIGHLFHF NDDGDDRPLA
61 RKLGLDADKY GPVFTFRLGL PLVLVVSSYE AVKDCFSTND AIFSNRPAFL YGDYLGYNNA
121 MLFLANYGPY WRKNRKLVIQ EVLSASRLEK FKHVRFARIQ ASIKNLYTRI DGNSSTINLT
181 DWLEELNFGI IVKMIAGKNY ESGKGDEQVE RFKKAFKDFM ILSMEFVLWD AFPIPLFKWV
241 DFQGHVKAMK RTFKDIDSVF QNWLEEHINK REKMEVNAEG NEQDFIDVVL SKMSNEYLGE
301 GYSRDTVICA TVFSLVLDAE DTVALHINWG MALLINNQKA LTKAQEEIDT KVGKDRWVEE
361 SDIKDLVYLQ AIVKEVLRLY PPGPLLPHE NVEDCVVSGY HIPKGTRLFA NVVKLQRDPK
421 LWSDPDTFDP ERFIATDIDF RGQYYKYIPF GSRRRSCPGM TYALQVEHLT MAHLIQGFNY
481 RTPNDEPLDM KEGAGITIRK VNPVELIIP RLAPELY

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**FIG. 156**

NAME D425-AC10  
 ORGANISM NICOTIANA TABACUM  
 SEQ ID 362

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1  CATAATGCTT TCTCCCATAG AAGCCATTGT AGGACTAGTA ACCTTCACAT TTCTCTTCTT
61 CTTCCTATGG ACAAAAAAAT CTCAAAAACC TTCAAAACCC TTACCACCGA AAATCCCCGG
121 AGGATGGCCG GTAATCGGCC ATCTTTTCCA CTTCAATGAC GACGGCGACG ACCGTCCATT
181 AGCTCGAAAA CTGGGAGACT TAGCTGACAA ATACGGCCCC GTTTTCACTT TTCGGCTAGG
241 CCTTCCCCTT GTCTTAGTTG TAAGCAGTTA CGAAGCTGTA AAAGACTGTT TCTCTACAAA
301 TGACGCCATT TTTTCCAATC GTCCAGCTTT TCTTTACGGC GATTACCTTG GCTACAATAA
361 TGCCATGCTA TTTTGGCCA ATTACGGACC TTACTGGCGA AAAAATCGAA AATTAGTTAT
421 TCAGGAAGTT CTCTCCGCTA GTCGTCTCGA AAAATTCAA CACGTGAGAT TTGCAAGAAT
481 TCAAGCGAGC ATTAAGAATT TATATACTCG AATTGATGGA AATTCGAGTA CGATAAATTT
541 AACTGATTGG TTAGAAGAAT TGAATTTTGG TCTGATCGTG AAGATGATCG CTGGAAAAAA
601 TTATGAATCC GGTAAAGGAG ATGAACAAAGT GGAGAGATTT AAGAAAGCGT TTAAGGATTT
661 TATGATTTTA TCAATGGAGT TTGTGTTATG GGATTCATTT CCAATTCCAT TATTTAAATG
721 GGTGGATTTT CAAGGGCATG TTAAGGCTAT GAAAAGGACT TTAAAGATA TAGATTCTGT
781 TTTTCAGAAAT TG GTTAGAGG AACATATTAA TAAAAGAGAA AAAATGGAGG TTAATGCAGA
841 AGGGAATGAA CAAGATTTCA TTGATGTGGT GCTTTCAAAA ATGAGTAATG AATATCTTGG
901 TGAAGGTTAC TCTCGTGATA CTGTCATTAA AGCAACGGTG TTTAGTTTGG TCTTGGATGC
961 AGCAGACACA GTTGCTCTTC ACATAAATTG GGAATGGCA TTATTGATGA ACAATCAAAA
1021 GGCCTTGACG AAAGCACAAG AAGAGATAGA CACAAAAGTT GGTAAGGACA GATGGGTAGA
1081 AGAGAGTGAT ATTAAGGATT TGGTATACCT CCAAGCTATT GTTAAAGAAG TGTACGATT
1141 ATATCCACCA GGACCTTTGT TAGTACCACA CGAAAATGTA GAAGATTGTG TTGTTAGTGG
1201 ATATCACATT CCTAAAGGGA CAAGATTATT CGCAAACGTC ATGAAACTGC AACGTGATCC
1261 TAAACTCTGG TCTGATCCTG ATACTTTCGA TCCAGAGAGA TTCATTGCTA CTGATATTGG
1321 CTTTCGTGGT CAGTACTATA AGTATATCCC GTTTGGTTCT GGAAGACGAT CTTGTCCAGG
1381 GATGACTTAT GCATTGCAAG TGGAACACTT AACAATGGCA CATTTGATCC AAGGTTTCAA
1441 TTACAGAACT CCAAATGACG AGCCCTTGGA TATGAAGGAA GGTGCAGGCA TAACTATACG
1501 TAAGGTAAAT CCTGTGGAAC TGATAATAGC GCCTCGCCTG GCACCTGAGC TTTATTAAAA
1561 CCTAAGATCA TCTTGCT

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**SEQ ID 363**

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1  MLSPIEIVG LVTFTFLFFF LWTKKSQKPS KPLPPKIPGG WPVIGHLFHF NDDGDDRPLA
61 RKLGLDLADKY GPVFTFRLGL PLVLVVSSE AVKDCFSTND AIFSNRPAFL YGDYLGYNNA
121 MLFLANYGPY WRKNRKLVIQ EVLSASRLEK FKHVRFARIQ ASIKNLYTRI DGNSSTINLT
181 DWLEELNFGI IVKMIAGKNY ESGKGDEQVE RFKKAFKDFM ILSMEFVLWD SFPIPLFKWV
241 DFQGHVKAMK RTFKDIDSVF QNWLEEHINK REKMEVNAEG NEQDFIDVVL SKMSNEYLGE
301 GYSRDTVIAK TVFSLVLDAA DTVALHINWG MALLMNNQKA LTKAQEEIDT KVGKDRWVEE
361 SDIKDLVYLQ AIVKEVLRLY PPGPLLVPHE NVEDCVVSGY HIPKGTRLFV NVMKLQRDPK
421 LWSDPDTFDP ERFIATDIGF RGQYYKYIPF GSRRRSCPGM TYALQVEHLT MAHLIQGFNY
481 RTPNDEPLDM KEGAGITIRK VNPVELIIP RLAPELY

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**FIG. 157**

NAME D425-AC11  
 ORGANISM NICOTIANA TABACUM  
 SEQ ID 364

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1  ATGCTTTCTC CCATAGAAGC CATTGTAGGA CTAGTAACCT TCACATTTCT CTTCTTCTTC
61 CTATGGACAA AAAAATCTCA AAAACCTTCA AAACCCTTAC CACCGAAAAT CCCC GGAGGA
121 TGGCCGGTAA TCGGCCATCT TTTCCACTTC AATGACGACG GCGACGACCG TCCATTAGCT
181 CGAAACTCG GAGACTTAGC TGACAAATAC GGCCCCGTTT CACTTTTTCG GCTAGGCCTT
241 CCCCTTGCTC TAGTTGTAAG CAGTTACGAA GCTGTAAAAG ACTGTTTCTC TACAAATGAC
301 GCCATTTTTT CCAATCGTCC AGCTTTTCTT TACGGCGATT ACCTTGGCTA CAATAATGCC
361 ATGCTATTTT TGGCCAATTA CGGACCTTAC TGGCGAAAAA ATCGAAAATT AGTTATTTCAG
421 GAAGTTCTCT CCGCTAGTCG TCTCGAAAAA TTCAAACACG TGAGATTTCG AAGAATTCAA
481 GCGAGCATTA AGAATTTATA TACTCGAATT GATGGAAATT CGAGTACGAT AAATTTAACT
541 GATTGGTTAG AAGAATTGAA TTTTGGTCTG ATCGTGAAGA TGATCGCTGG AAAAAATTAT
601 GAATCCGGTA AAGGAGATGA ACAAGTGGAG AGATTTAAGA AAGCGTTTAA GGATTTTATG
661 ATTTTATCAA TGGAGTTTGT GTTATGGGAT GCATTTCCAA TTCCATTATT TAAATGGGTG
721 GACTTTCAAG GGCATGTTAA GGCTATGAAA AGGACTTTTA AAGATATAGA TTCTGTTTTT
781 CAGAATTGGT TAGAGGAACA TATTAATAAA AGAGAAAAAA TGGAGGTTAA TGCAGAAGGG
841 AATGAACAAG ATTTTCATTGA TGTGGTGCTT TCAAAAATGA GTAATGAATA TCTTGGTGAA
901 GGTACTCTC GTGATACTGT CATTAAAGCA ACGGTGTTTA GTTGGTCTT GGATGCAGCA
961 GACACAGTTG CTCTTCACAT AAATTGGGGA ATGGCATTAT TGATAAACAA TCAAAGGCC
1021 TTGACGAAAG CACAAGAAGA GATAGACACA AAAGTTGGTA AGGACAGATG GGTAGAAGAG
1081 AGTGATATTA AGGATTTGGT ATACCTCCAA GCTATTGTTA AAGAAGTGT ACGATTATAT
1141 CCACCAGGAC CTTTGTAGT ACCACACGAA AATGTAGAAG ATTGTGTTGT TAGTGGATAT
1201 CACATTCCTA AAGGGACAAG ATTATTGCGA AACGTCATGA AACTGCAACG TGATCCTAAA
1261 CTCTGGTCTG ATCCTGATAC TTTGATCCA GAGAGATTCA TTGCTACTGA TATTGACTTT
1321 CGTGGTCACT ACTATAAGTA TATCCCGTTT GGTCTGGA GACGATCTTG TCCAGGGATG
1381 ACTTATGCAT TGCAAGTGGA ACACTTAACA ATGGCACATT TGATCCAAGG TTTCAATTAC
1441 AGAACTCCAA ATGACGAGCC CTTGGATATG AAGGAAGGTG CAGGCATAAC TATACGTAAG
1501 GTAAATCCTG TGGAACGTG AATAGCGCCT CGCCTGGCAC CTGAGCTTTA TTAAACCTA
1561 AGATCATCTT GCT

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**SEQ ID 365**

```

1  MLSPIEAIVG LVTFTFLFFF LWTKKSQKPS KPLPPKIPGG WPVIGHLFHF NDDGDDRPLA
61 RKLGLDADKY GPVFTFRLGL PLVLVVSSYE AVKDCFSTND AIFS NRPAFL YGDYLGYNNA
121 MLFLANYGPY WRKNRKLVIQ EVLSASRLEK FKHVRFARIQ ASIKNLYTRI DGNSSTINLT
181 DWLEELNFGL IVKMIAGKNY ESGKGDEQVE RFKKAFKDFM ILSMEFVLWD AFPIPLFKWV
241 DFQGHVKAMK RAFKDIDSVF QNWLEEHINK REKMEVNAEG NEQDFIDVVL SKMSNEYLGE
301 GYSRDTVICA TVFSLVLDAA DTVALHINWG MALLINNQKA LTKAQEEIDT KVGKDRWVEE
361 SDIKDLVYLQ AIVKEVLRLY PPGPLLVPHE NVEDCVVSGY HIPKGTRLFV NVMKLQRDPK
421 LWSDPDTFDP ERFIATDIDF RGQYYKYIPF GSGRRSCPGM TYALQVEHLT MAHLIQGFNY
481 RTPNDEPLDM KEGAGITIRK VNPVELIIAP RLAPELY

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**FIG. 158**

NAME D425-AG11  
 ORGANISM NICOTIANA TABACUM  
 SEQ ID 366

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1  ATGCTTTCTC CCATAGAAGC CATTGTAGGA CTAGTAACCT TCACATTTCT CTTCTTCTTC
61 CTATGGACAA AAAAATCTCA AAAACCTTCA AAACCCCTAC CACCGAAAAT CCGCGGAGGA
121 TGGCCGGTAA TCGGCCATCT TTTCCACTTC AATGACGACG GCGATGACCG TCCATTAGCT
181 CGAAAACTCG GAGACTTAGC TGACAAATAC GGCCCCGTTT TCACTTTTCG GCTAGGCCTT
241 CCCCTTGTCT TAGTTGTAAG CAGTTACGAA GCTGTAAAAG ACTGTTTCTC TACAAATGAC
301 GCCATTTTTT CCAATCGTCC AGCTTTTCTT TACGGCGATT ACCTTGGCTA CAATAATGCC
361 ATGCTATTTT TGGCCAATTA CGGACCTTAC TGGCGAAAAA ATCGAAAATT AGTTATTGAG
421 GAAGTTCTCT CCGCTAGTCG TCTCGAAAAA TTCAAACACG TGAGATTGTC AAGAATTCAA
481 GCGAGCATTA AGAATTTATA TACTCGAATT GATGGAAATT CGAGTACGAT AAATTTAACT
541 GATTGGTTAG AAGAATTGAA TTTTGGCCTG ATCGTGAAGA TGATCGCTGG AAAAAATTAT
601 GAATCCGGTA AAGGAGATGA ACAAGTGGAG AGATTTAAGA AAGCGTTTAA GGATTTTATG
661 ATTTTATCAA TGGAGTTTGT GTTATGGGAT GCATTTCCAA TTCCATTATT TAAATGGGTG
721 GATTTTCAAG GGCATGTTAA GGCTATGAAA AGGGCTTTTA AAGATATAGA TTCTGTTTTT
781 CAGAATTGGT TAGAGGAACA TATTAATAAA AGAGAAAAAA TGGAGGTAA TGCAGAAGGG
841 AATGAACAAG ATTTCAATTGA TGTGGTGCTT TCAAAAATGA GTAATGAATA TCTTGGTGAA
901 GGTTACTCTC GTGATACTGT CATTAAAGCA ACGGTGTTTA GTTTGGTCTT GGATGCAGCA
961 GACACAGTTG CTCTTCACAT AAATTGGGGA ATGGCATTAT TGATAAACAA TCAAAAGGCC
1021 TTGACGAAAG CACAAGAAGA GATAGACACA AAAGTTGGTA AGGACAGATG GGTAGAAGAG
1081 AGTGATATTA AGGATTTGGT ATACCTCCAA GCTATTGTTA AAGAAGTGTT ACGATTATAT
1141 CCACCAGGAC CTTTGTTAGT ACCACACGAA AATGTAGAAG ATTGTGTTGT TAGTGGATAT
1201 CACATTCCTA AAGGGACAAG ATTATTCGTA AACGTCATGA AACTGCAACG TGATCCTAAA
1261 CTCTGGTCTG ATCCTGATAC TTTCGATCCA GAGAGATTCA TTGCTACTGA TATTGACTTT
1321 CGTGGTCACT ACTATAAGTA TATCCCGTTT GGTCTTGGA GACGATCTTG TCCAGGGATG
1381 ACTTATGCAT TGCAAGTGGA ACACTTAACA ATGGCACATT TGATCCAAGG TTTCAATTAC
1441 AGAACTCCAA ATGACGAGCC CTTGGATATG AAGGAAGGTG CAGGCATAAC TATACGTAAG
1501 GTAAATCCTG TGGAACTGAT AATAGCGCCT CGCCTGGCAC CTGAGCTTTA TTAACCTA
1561 AGATCATCTT GCT

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**SEQ ID 367**

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1  MLSPIEAIVG LVTFTFLFFF LWTKKSQKPS KPLPPKIPGG WPVIGHLFHF NDDGDDRPLA
61 RKLGLDADKY GPVFTFRLGL PLVLVVSSYE AVKDCFSTND AIFSNRPAFL YGDYLGYNNA
121 MLFLANYGPY WRKNRKLVIQ EVLSASRLEK FKHVRFARIQ ASIKNLYTRI DGNSSTINLT
181 DWLEELNFGI IVKMIAGKNY ESGKGDEQVE RFKKAFKDFM ILSMEFVLWD AFPIPLFKWV
241 DFQGHVKAMK RAFKDIDSVF QNWLEEHINK REKMEVNAEG NEQDFIDVVL SKMSNEYLGE
301 GYSRDTVIKA TVFSLVLDAA DTVALHINWG MALLINNQKA LTKAQEEIDT KVGKDRWVEE
361 SDIKDLVYLQ AIVKEVLRLY PPGPLLVPHE NVEDCVVSGY HIPKGTRLFV NVMKLQRDPK
421 LWSDPDTFDP ERFIATDIDF RGQYYKYIPF GSGRRSCPGM TYALQVEHLT MAHLIQGFNY
481 RTPNDEPLDM KEGAGITIRK VNPVELIIAP RLAPELY

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**FIG. 159**

NAME D425-AH7  
 ORGANISM NICOTIANA TABACUM  
 SEQ ID 368

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1 ATGCTTTCTC CCATAGAAGC CATTGTAGGA CTAGTAACCT TCACATTTCT CTTCTTCTTC
61 CTATGGACAA AAAAATCTCA AAAACCTTCA AAACCCTTAC CACCGAAAAT CCGCGGAGGA
121 TGGCCGGTAA TCGGCCATCT TTTCCACTTC AATGACGACG GCGACGACCG TCCATTAGCT
181 CGAAAACTCG GAGACTTAGC TGACAAATAC GGCCCCGTTT TCACTTTTCG GCTAGGCCTT
241 CCCCTTGTCT TAGTTGTAAG CAGTTACGAA GCTGTAAAAG ACTGTTTCTC TACAAATGAC
301 GCCATTTTTT CCAATCGTCC AGCTTTTCTT TACGGCGATT ACCTTGGCTA CAATAATGCC
361 ATGCTATTTT TGGCCAATTA CGGACCTTAC TGGCGAAAAA ATCGAAAATT AGTTATTCAG
421 GAAGTTCTCT CCGCTAGTCG TCTCGAAAAA TTCAAACACG TGAGATTGTC AAGAATTCAA
481 GCGAGCATT AAGAATTATA TACTCGAATT GATGGAAATT CGAGTACGAT AAATTTAACT
541 GATTGGTTAG AAGAATTGAA TTTTGGTCTG GTCGTGAAGA TGATCGCTGG AAAAAATTAT
601 GAATCCGGTA AAGGAGATGA ACAAGTGGAG AGATTTAAGA AAGCGTTTGA GGATTTTATG
661 ATTTTATCAA TGGAGTTTGT GTTATGGGAT GCATTTCCAA TTCCATTATT TAAATGGGTG
721 GATTTTCAAG GGCATGTTAA GGCTATGAAA AGGACTTTTA AAGATATAGA TTCTGTTTTT
781 CAGAATTGGT TAGAGGAACA TATTAATAAA AGAGAAAAAA TGGAGGTTAA TGCAGAAGGG
841 AATGAACAAG ATTTTCATTGA TGTGGTGCTT TCAAAAATGA GTAATGAATA TCTTGGTGAA
901 GGTTACTCTC GTGATACTGT CATTAAAGCA ACGGTGTTTA GTTGGTCTT GGATGCAGCA
961 GACACAGTTG CTCTTCACAT AAATTGGGGA ATGGCATTAT TGATAAACAA TCAAAGGCC
1021 TTGACGAAAG CACAAGAAGA GATAGACACA AAAGTTGGTA AGGACAGATG GGTAGAAGAG
1081 AGTGATATTA AGGATTTGGT ATACCTCCAA GCTATTGTTA AAGAAGTGTT ACGATTATAT
1141 CCACCAGGAC CTTTGTTAGT ACCACACGAA AATGTAGAAG ATTGTGTTGT TAGTGGATAT
1201 CACATTCCTA AAGGGACAAG ATTATTCGCA AACGTCATGA AACTGCAACG TGATCCTAAA
1261 CTCTGGTCTG ATCCTGATAC TTTGATCCA GAGAGATTCA TTGCTACTGA TATTGACTTT
1321 CGTGGTCAGT ACTATAAGTA TATCCCGTTT GGTTCTGGAA GACGATCTTG TCCAGGGATG
1381 ACTTATGCAT TGCAAGTGGA ACACCTAACA ATGGCACATT TGATCCAAGG TTTCAATTAC
1441 AGAACTCCAA ATGACGAGCC CTTGGATATG AAGGAAGGTG CAGGCATAAC TATACGTAAG
1501 GTAAATCCTG TGGAACGTAT AATAGCGCCT CGCCTGGCAC CTGAGCTTTA TTAAAACCTA
1561 AGATCATCTT GCT

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**SEQ ID 369**

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1 MLSPIEAIVG LVTFTFLFFF LWTKKSQKPS KPLPPKIPGG WPVIGHLFHF NDDGDDRPLA
61 RKLGLDLADKY GPVFTFRLGL PLVLVVSSYE AVKDCFSTND AIFSNRPAFL YGDYLGYNNA
121 MLFLANYGPY WRKNRKLVIQ EVLSASRLEK FKHVRFARIQ ASIKNLYTRI DGNSSTINLT
181 DWLEELNFGL VVKMIAGKNY ESGKGDEQVE RFKKAFEDFM ILSMEFVLWD AFPIPLFKWV
241 DFQGHVKAMK RTFKDIDSFV QNWLEEHINK REKMEVNAEG NEQDFIDVVL SKMSNEYLGE
301 GYSRDTVICA TVFSLVLDAE DTVALHINWG MALLINNQKA LTKAQEEIDT KVGKDRWVEE
361 SDIKDLVYLQ AIVKEVLRLY PPGPLLPHE NVEDCVVSGY HIPKGTRLFA NVMKLQRDPK
421 LWSDPDTFDP ERFIATDIDF RGQYYKYIPF GSRRRSCPGM TYALQVEHLT MAHLIQGFNY
481 RTPNDEPLDM KEGAGITIRK VNPVELIIAP RLAPELY

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**FIG. 160**

NAME D425-AH11  
 ORGANISM NICOTIANA TABACUM  
 SEQ ID 370

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1 ATGCTTTCTC CCATAGAAGC CATTGTAGGA CTAGTAACCT TCACATTTCT CTTCTTCTTC
61 CTATGGACAA AAAAATCTCA AAAACCTTCA AAACCCCTAC CACCGAAAAT CCCC GGAGGA
121 TGGCCGGTAA TCGGCCATCT TTTCCACTTC AATGACGACG GCGACGACCG TCCATTAGCT
181 CAAAAACTCG GAGACTTAGC TGACAAATAC GGCCCCGTTT TCACTTTTCG GCTAGGCCTT
241 CCCCTTGTCT TAGTTGTAAG CAGTTACGAA GCTGTAAAAG ACTGTTTCTC TACAGATGAC
301 GCCATTTTTT CCAATCGTCC AGCTTTTCTT TACGGCGATT ACCTTGGCTA CAATAATGCC
361 ATGCTATTTT TGGCCAATTA CGGACCTTAC TGGCGAAAAA ATCGAAAAAT AGTTATTTCAG
421 GAAGTTCTCT CCGCTAGTCG TCTCGAAAAA TTCAAACACG TGAGATTTCG AAGAATTCAA
481 GCGAGCATTA AGAATTTATA TACTCGAATT GATGGAAATT CGAGTACGAT AAATTTAACT
541 GATTGGTTAG AAGAATTGAA TTTTGGTCTG ATCGTGAAGA TGATCGCTGG AAAAAATTAT
601 GAATCCGGTA AAGGAGATGA ACAAGTGGAG AGATTTAAGA AAGCGTTTAA GGATTTTATG
661 ATTTTATCAA TGGAGTTTGT GTTATGGGAT GCATTTCCAA TTCCATTATT TAAATGGGTG
721 GATTTTCAAG GGCATGTAA GGCTATGAAA AGGACTTTTA AAGATATAGA TTCTGTTTTT
781 CAGAATTGGT TAGAGGAACA TATTAATAAA AGAGAAAAAA TGGAGGTAA TGCAGAAGGG
841 AATGAACAAG ATTTCATTGA TGTGGTGCTT TCAAAAATGA GTAATGAATA TCTTGGTGAA
901 GGTACTCTC GTGATACTGT CATTAAAGCA ACGGTGTTTG GTTTGGTCTT GGATGCAGCA
961 GACACAGTTG CTCTTCACAT AAATTGGGGA ATGGCATTAT TGATAAACAA TCAAAGGCC
1021 TTGACGAAAG CACAAGAAGA GATAGACACA AAAGTTGGTA AGGACAGATG GGTAGAAGAG
1081 AGTGATATTA AGGATTTGGT ATACCTCCAA GCTATTGTTA AAGAAGTGTT ACGATTATAT
1141 CCACCAGGAC CTTTGTTAGT ACCACACGAA AATGTAGAAG ATTGTGTTGT TAGTGGATAT
1201 CACATTCCTA AAGGGACAAG ATTATTGCGA AACGTCATGA AACTGCAACG TGATCCTAAA
1261 CTCTGGTCTG ATCCTGATAC TTTGATCCA GAGAGATTCA TTGCTACTGA TATTGACTTT
1321 CGTGGTCAGT ACTATAAGTA TATCCCGTTT GGTCTGGAA GACGATCTTG TCCAGGGATG
1381 ACTTATGCAT TGCAAGTGGA ACACTTAACA ATAGCACATT TGATCCAAGG TTTCAATTAC
1441 AGAACTCCAA ATGACGAGCC CTTGGATATG AAGGAAGGTG CAGGCATAAC TATACGTAAG
1501 GTAAATCCTG TGGAACTGAT AATAGCGCCT CGCCTGGCAC CTGAGCTTTA TTAACCTA
1561 AGATCATCTT GCT

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**SEQ ID 371**

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1 MLSPIEAIVG LVTFTFLFFF LWTKKSQKPS KPLPPKIPGG WPVIGHLFHF NDDGDDRPLA
61 QKLGDLADKY GPVFTFRLGL PLVLVSSYE AVKDCFSTDD AIFSNRPAFL YGDYLGYNNA
121 MLFLANYGPY WRKNRKLVIQ EVLSASRLEK FKHVRFARIQ ASIKNLYTRI DGNSSTINLT
181 DWLEELNFGL IVKMIAGKNY ESGKGDEQVE RFKKAFKDFM ILSMEFVLWD AFPIPLFKWV
241 DFQGHVKAMK RTFKDIDSVF QNWLEEHINK REKMEVNAEG NEQDFIDVVL SKMSNEYLGE
301 GYSRDTVICA TVFGLVLDAA DTVALHINWG MALLINNQKA LTKAQEEIDT KVGKDRWVEE
361 SDIKDLVYLQ AIVKEVLRLY PPGPLVPHE NVEDCVVSGY HIPKGTRLFA NVMKLQRDPK
421 LWSDPDTFDP ERFIATDIDF RGQYYKYIPF GSGRRSCPGM TYALQVEHLT IAHLIQGFNY
481 RTPNDEPLDM KEGAGITIRK VNPVELIIP RLAPELY

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**FIG. 161**

NAME D427-AA5  
 ORGANISM NICOTIANA TABACUM  
 SEQ ID 372

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1  ATGCTTTCTC CCATAGAAGC CATTGTAGGA CTAGTAACCT TCACATTTCT CTTCTTCTTC
61 CTATGGACAA AAAAATCTCA AAAACCTTCA AAACCCTTAC CACCGAAAAT CCCC GGAGGA
121 TGGCCGGTAA TCGGCCATCT TTTCCACTTC AATGACGACG GCGACGACCG TCCATTAGCT
181 CGAAAACCTCG GAGACTTAGC TGACAAATAC GGCCCCGTTT TCACTTTTCG GCTAGGCCTT
241 CCCCTTGTCT TAGTTGTAAG CAGTTACGAA GCTGTAAAAG ACTGTTTCTC TACAAATGAC
301 GCCATTTTTT CCAATCGTCC AGCTTTTCTT TACGGCGATT ACCTTGCGTA CAATAATGCC
361 ATGCTATTTT TGGCCAATTA CGGACCTTAC TGGCGAAAAA ATCGAAAAAT AGTTATTTCAG
421 GAAGTTCTCT CCGCTAGTCG TCTCGAAAAA TTCAAACACG TGAGATTTCG AAGAATTCAA
481 GCGAGCATTA AGAATTATA TACTCGAATT GATGGAAATT CGAGTACGAT AAATTTAACT
541 GATTGGTTAG AAGAATTGAA TTTTGGTCTG ATCGTGAAGA TGATCGCTGG AAAAAATTAT
601 GAATCCGGTA AAGGAGATGA ACAAGTGGAG AGATTTAAGA AAGCGTTTAA GGATTTTATG
661 ATTTTATCAA TGGAGTTTGT GTTATGGGAT GCATTTCCAA TTCCATTATT TAAATGGGTG
721 GATTTTCAAG GGCATGTTAA GGCTATGAAA AGGACTTTTA AAGATATAGA TTCTGTTTTT
781 CAGAATTGGT TAGAGGAACA TATTAATAAA AGAGAAAAAA TGGAGGTAA TGCAGAAGGG
841 AATGAACAAG ATTTTCATTGA TGTGGTGCTT TCAAAAATGA GTAATGAATA TCTTGGTGAA
901 GGTTACTCTC GTGATACTGT CATTAAAGCA ACGGTGTTTA GTTTGGTCTT GGATGCAGCA
961 GACACAGTTG CTCTTCACAT AAATTGGGGA ATGGCATTAT TGATAAACAA TCAAAGGCC
1021 TTGACGAAAG CACAAGAAGA GATAGACACA AAAGTTGGTA AGGACAGATG GGTAGAAGAG
1081 AGTGATATTA AGGATTTGGT ATACCTCCAA GCTATTGTTA AAGAAGTGTT ACGATTATAT
1141 CCACCAGGAC CTTTGTAGT ACCACACGAA AATGTAGAAG ATTGTGTTGT TAGTGGATAT
1201 CACATTCCTA AAGGGACAAG ATTATTCGCA AACGTCATGA AACTGCAACG TGATCCTAAA
1261 CTCTGGTCTG ATCCTGATAC TTTCGATCCA GAGAGATTCA TTGCTACTGA TATTGACTTT
1321 CGTGGTCAGT ACTATAAGTA TATCCCGTTT GGTCTCGGAA GACGATCTTG TCCAGGGATG
1381 ACTTATGCAT TGCAAGTGGA ACACCTAACA ATGGCACATT TGATCCAAGG TTTCAATTAC
1441 AGAACTCCAA ATGACGAGCC CTCGGATATG AAGGAAGGTG CAGGCATAAC TATACGTAAA
1501 GTAAATCCTG TGGAACGTGAT AATAGCGCCT CGCCTGGCAC CTGAGCTTTA TTAAACCTA
1561 AGATCATCTT GCTTG

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**SEQ ID 373**

```

1  MLSPIEAIVG LVTFTFLFFF LWTKKSQKPS KPLPPKIPGG WPVIGHLFHF NDDGDDRPLA
61 RKLGLDADKY GPVFTFRLGL PLVLVVSSYE AVKDCFSTND AIFSNRPAFL YGDYLGYNNA
121 MLFLANYGPY WRKNRKLVIQ EVLSASRLEK FKHVRFARIQ ASIKNLYTRI DGNSSTINLT
181 DWLEELNFGL IVKMIAGKNY ESGKGDEQVE RFKKAFKDFM ILSMEFVLWD AFPIPLFKWV
241 DFQGHVKAMK RTFKDIDSVF QNWLEEHINK REKMEVNAEG NEQDFIDVVL SKMSNEYLGE
301 GYSRDTVIAK TVFSLVLDAA DTVALHINWG MALLINNOKA LTKAQEEIDT KVGKDRWVEE
361 SDIKDLVYLQ AIVKEVLRLY PPGPLLVPHE NVEDCVVSGY HIPKGTRLFA NVMKLQRDPK
421 LWSDPDTFDP ERFIATDIDF RGQYYKYIPF GSGRRSCPGM TYALQVEHLT MAHLIQGFNY
481 RTPNDEPSDM KEGAGITIRK VNPVELIIP RLAPELY

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FIG. 162 Probe set sequences of all clones on GeneChip

Probe Set Name	Probe			Probe Interrogation		Probe Sequence	SEQ ID
	X	Y	Position				
GEN1018_x_at	D120-AH4	7	65	14		GAAAGCGTTTAAGGATTTTATGATT	374
GEN1018_x_at	D120-AH4	110	91	35		GATTTTATCAATGGAGTTTGTGTTA	375
GEN1018_x_at	D120-AH4	65	115	57		TTATGGGATGCATTTCCCAATTCCAT	376
GEN1018_x_at	D120-AH4	52	111	60		TGGGATGCATTTCCCAATTCATTAT	377
GEN1018_x_at	D120-AH4	18	97	62		GGATGCATTTCCCAATTCATTATTT	378
GEN1018_x_at	D120-AH4	38	85	63		GATGCATTTCCCAATTCATTATTTA	379
GEN1018_x_at	D120-AH4	99	117	65		TGCATTTCCCAATTCATTATTTAAA	380
GEN1018_x_at	D120-AH4	18	69	66		GCATTTCCCAATTCATTATTTAAAT	381
GEN1018_x_at	D120-AH4	59	3	82		TATTTAAATGGGTGGATTTTCAAGG	382
GEN1018_x_at	D120-AH4	13	23	97		ATTTTCAAGGGCATGTTAAGGCTAT	383
GEN1018_x_at	D120-AH4	28	53	102		CAAGGGCATGTTAAGGCTATGAAAA	384
GEN1018_x_at	D120-AH4	10	93	106		GGCATGTTAAGGCTATGAAAAAGGAC	385
GEN1018_x_at	D120-AH4	44	79	110		TGTTAAGGCTATGAAAAAGGACTTTT	386
GEN1018_x_at	D120-AH4	95	47	274		AAGGTTACTCTCGTGATACCTGTCAT	387
GEN1018_x_at	D120-AH4	1	73	333		GCAGACACAGTTGCTCTTCACATAA	388
GEN1018_x_at	D120-AH4	63	41	339		ACAGTTGCTCTTCACATAAAATTGGG	389
GEN1018_x_at	D120-AH4	84	81	473		GGTATACCTCCAAGCTATTGTTAAA	390
GEN1018_x_at	D120-AH4	25	95	501		GTGTTACGATTATATCCACCAGGAC	391
GEN1018_x_at	D120-AH4	69	21	505		TACGATTATATCCACCAGGACCTTT	392
GEN1018_x_at	D120-AH4	67	3	519		CCAGGACCTTTGTTAGTACACACACG	393
GEN1018_x_at	D120-AH4	30	3	525		CCTTTGTTAGTACACACACGAAAATG	394
GEN1018_x_at	D120-AH4	1	107	622		TACGTGATCTTAAACTCTGGCCCTGA	395
GEN1018_x_at	D120-AH4	72	19	643		CTGATCCTGATACTTTTCGATCCAGA	396
GEN1018_x_at	D120-AH4	33	55	690		GACTTTCGTGGTCAGTACTATAAGT	397
GEN1018_x_at	D120-AH4	103	103	698		TGGTCAGTACTATAAGTATATCCCG	398
GEN1019_x_at	D121-AA8	107	73	13		GAATTGAATTTTGGTCTGATCGTGA	399
GEN1019_x_at	D121-AA8	65	107	24		TGGTCTGATCGTGAAGATGATCGCT	400
GEN1019_x_at	D121-AA8	119	25	31		ATCGTGAAGATGATCGCTGGAAAAA	401
GEN1019_x_at	D121-AA8	72	71	39		GATGATCGCTGGAAAAAATATGAA	402

FIG. 162 Probe set sequences of all clones on GeneChip

Probe Set Name	Probe Interrogation			Probe		SEQ ID
	X	Y	Position	Sequence		
GEN1019_x_at	D121-AA8	107	105	58	TATGAATCCGGTAAAGGAGATGAAC	403
GEN1019_x_at	D121-AA8	69	1	64	TCCGGTAAAGGAGATGAACAAGTGG	404
GEN1019_x_at	D121-AA8	1	15	80	AACAAGTGGAGAGATTTAAGAAAGC	405
GEN1019_x_at	D121-AA8	111	91	120	GATTTTATCAATGGAGTTTGTGTTA	406
GEN1019_x_at	D121-AA8	63	115	142	TTATGGGATGCATTTCCAATTCCAT	407
GEN1019_x_at	D121-AA8	54	111	145	TGGGATGCATTTCCAATTCCATAT	408
GEN1019_x_at	D121-AA8	14	97	147	GGATGCATTTCCAATTCCATATTT	409
GEN1019_x_at	D121-AA8	35	85	148	GATGCATTTCCAATTCCATATTTTA	410
GEN1019_x_at	D121-AA8	98	117	150	TGCATTTCCAATTCCAATTATTTAAA	411
GEN1019_x_at	D121-AA8	96	59	164	CATTATTTAAATGGGTGGATTTTCA	412
GEN1019_x_at	D121-AA8	12	23	182	ATTTTCAAGGGCATGTTAAGGCTAT	413
GEN1019_x_at	D121-AA8	27	53	187	CAAGGCATGTTAAGGCTATGAAAA	414
GEN1019_x_at	D121-AA8	45	79	195	TGTTAAGGCTATGAAAAAGGACTTTT	415
GEN1019_x_at	D121-AA8	94	47	359	AAGTTACTCTCGTGATACTGTGAT	416
GEN1019_x_at	D121-AA8	2	73	418	GCAGACACAGTTGCTCTTCACATAA	417
GEN1019_x_at	D121-AA8	74	83	588	GTTACGATTATATCCACCAGGACCT	418
GEN1019_x_at	D121-AA8	66	3	604	CCAGGACCTTTGTTAGTACCACACG	419
GEN1019_x_at	D121-AA8	31	3	610	CCTTTGTTAGTACCACACGAAAAATG	420
GEN1019_x_at	D121-AA8	111	11	719	AACTCTGGTCTGATCCTGATACCTT	421
GEN1019_x_at	D121-AA8	32	55	775	GACTTTCGTGGTCACTACTATAAGT	422
GEN1019_x_at	D121-AA8	102	103	783	TGGTCAGTACTATAAGTATATATCCCG	423
GEN2012_x_at	D35-BG11	32	7	58	GATCCAAGGTTTCAATTACAGAACT	424
GEN2012_x_at	D35-BG11	119	101	114	GTGCAGGCATAACTATACGTAAGGT	425
GEN2012_x_at	D35-BG11	21	27	140	AATCCTGTGGAACCTGATAAATAGCGC	426
GEN2012_x_at	D35-BG11	66	21	141	ATCCTGTGGAACCTGATAAATAGCGCC	427
GEN2012_x_at	D35-BG11	108	17	143	CCTGTGGAACCTGATAAATAGCGCCTC	428
GEN2012_x_at	D35-BG11	71	105	145	TGTGGAACCTGATAAATAGCGCCTCGC	429
GEN2012_x_at	D35-BG11	64	99	148	GGAACCTGATAAATAGCGCCTCGCCTG	430
GEN2012_x_at	D35-BG11	14	77	149	GAACTGATAAATAGCGCCTCGCCTGG	431

Probe set sequences of all clones on GeneChip

FIG. 162

Probe Set Name	Probe				SEQ ID	
	Probe Interrogation		Probe Sequence			
	X	Y		Position		
GEN2012_x_at	D35-BG11	119	33	151	ACTGATAATAGCGCCTCGCCTGGCA	432
GEN2012_x_at	D35-BG11	17	109	166	TCGCCCTGGCACCTGAGCTTTATTAA	433
GEN2012_x_at	D35-BG11	58	55	170	CTGGCACCTGAGCTTTATTAAACC	434

FIG. 163

## SEQ. ID. NO. 434

D424-AA4

```

1 GTTTTTCCCA TAGAAGCCTT TGTAGGACTA GTAACCTTCA CATTCTCTCTC ATACTTCCTA
61 TGGACAAAAA AATCTCAAAA ACTTCCAAAA CCCTTACCAC CGAAAATCCC CGGAGGATGG
121 CCGGTAATCG GCCATCTTTT TCACTTCAAT AACGACGGCG ACGACCGTCC ATTAGCTCGA
181 AAACCTCGGAG ACTTAGCTGA TAAATACGGC CCCGTTTTCA CTTTTCGGCT AGGTCTTCCC
241 CTTGTGCTAG TTGTAAGCAG TTACGAAGCT ATAAAAGATT GCTTCTCTAC AAATGACGCC
301 ATTTTCTCCA ATCGTCCAGC TTTTCTTTAC GCGAATACC TTGGCTACAA TAATACAATG
361 CTTTTTCTAG CAAATTACGG ACCTTACTGG CGA

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## SEQ. ID. NO. 435

D424-AF5

```

1 TAGTATACCT CCAAGCTATT GTTAAAAAGG TGTTACGATT ATATCCACCA GGACCTTTGT
61 TAGTACCACA TGAAAATGTA AAGGATTGTG TTGTTAGTGG ATATCACATT CCTAAAGGGA
121 CTAGATTATT CGCAAACGTC ATGAAACTGC AGCGCGATCC TAAATTCTTG TCAAATCCTG
181 ATAAGTTCTGA TCCAGAGAGA TTCATCGCTG GTGATATTGA CTTCCGTGGT CACCACTATG
241 AGTTTATCCC ATTTGGTTCT GGAAGACGAT CTTGTCCGGG GATGACTTAT GCATCGCAAG
301 TGGAACACCT AACAATGGCA CATTTAGTCC AGGGTTTCAA TTACAAAACCT CCAAATGACG
361 AGGCCTTGGA TATGAAGGAA GGTGCAGGCA TAACAATACG TAAGGTAAAT CCAGTGGAAT
421 TGATAGTAAC GCCTCGCTTG GCACCTGAGC TTTACTAAAC CTAAGATCTT TCATCTTGG

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## SEQ. ID. NO. 436

```

1 VYLQAIVKKV LRLYPGPPLL VPHENVKDCV VSGYHIPKGT RLFANVMKLQ RDPKFLSNPD
61 KFDPERFIAG DIDFRGHHYE FIPFGSGRRS CPGMTYASQV EHLTMAHLVQ GFNYKTPNDE
121 ALDMKEGAGI TIRKVNVEL IVTPRLAPEL Y

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## SEQ. ID. NO. 437

D425-AA11

```

1 GGATAGATGG GTAGAAGAGA GTGATATTAA GGATTTGGTG TACCTCCAAG CTATTGTCAA
61 AGAAGTGTTA CGATTGTATC CACCAGGACC TTTGTTAGTA CCACATGAAA ATGTGGAGGA
121 TTGTGTTGTT AGTGATATC ACATTCCCTAA AGGGACTAGA CTATTGCGA ATGTCATGAA
181 ACTGTAAACG GATCCTAAAC TCTGGCCAAA TCCTGATAAT TTCGATCCAG AGAGATTCAT
241 CGCTGCAGAT ATTGACTTCC GTGGTCAGCA CTATGAGTAT ATCCCGTTTG GTTCTGGAAG
301 ACGATCTTGT CCGGGGATGA CTTATGCATT GCAAGCGGAA CATCTAACAA TGGCACATTT
361 GATCCAAGGT TTCAATTACA GGACTCCAAC TAACGAGCCC TTGGATATGA AGGAAGGTGC
421 AGGCATAACT ATACGTAAGG TAAATCCTGT GGAAGTGCTA ATTAAGCCTC GCCTGGCACC
481 CGAGCTTTAT TAAAACCTAA GATCATCTTG CT

```

## SEQ. ID. NO. 438

```

1 DRWVEESDIK DLVYLQAIVK EVLRLYPGP LLVPHENVED CVVSGYHIPK GTRLFANVMK
61 L.RDPKLWPN PDNFDPERFI AADIDFRGQH YEYIPFGSGR RSCPGMTYAL QAEHLTMAHL
121 IQGFNYRTPT NEPLDMKEGA GITIRKVNVP EVLIKRLAP ELY

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## SEQ. ID. NO. 439

D425-AF11

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1 AGGATAGATG GGTAGAAGAG AGTGATATTA AGGATTTGGT GTACCTCCAA GCTATTGTCA
61 AAGAAGTGTT ACGATTGTAT CCACCAGGAC CTTTGTTAGT ACCACATGAA AATGTAGAGG
121 ATTGTGTTGT TAGTGGATAT CACATTCCCTA AAGGGACTAG ACTATTTGCG AATGTCATGA
181 AACTGCAACG CGATCCTAAA CTCTGGCCAA ATCCTGATAA TTTCGATCCA GAGAGATTCTG
241 TCGTGTCAGA TATTGACTTC CGTGGTCAGC ACTATGAGTA TATCCCGTTT GGTTCTGGAA
301 GACGATCTTG TCCGGGGGTG ACTTATGCAT TGCAAGTGGA ACATCACATT TGATCCAAGG
361 TTTCAATTAC AGGACTCCAA CTAACGAGCC CTTGGATATG AAGGAAGGTG CACGCATAAC
421 TATACGTAAG GTAAATCCTG TGGAAGTGCT AATTAAGCCT AGCCTGGCAC CTGAGCTTTA

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481 TTAAACCTA AGATCATCTT GCT

**SEQ. ID. NO. 440**

1 VYPVWFWKTI LSGGDLCIAS GTSHLIQGFN YRTPTNEPLD MKEGARITIR KVNPFVEVLIK  
61 PSLAPELY

**SEQ. ID. NO. 441**

D425-AH10

1 CTGAAATAGA GGGAGTATAA TATTCATTTT AAGAGATCAC TATAAAAAGG AAGTTCGTGA  
61 TAGTTTGATT CTCAAGTTCT TATCTAAAAA TCCATAATGG TTTTCCCAT AGAAGCCATT  
121 GTAGGACTAG TAACCTTCAC ATTTCTCTTA TACTTCCTAT GGACAAAAAA ATCTCAAAAA  
181 CCTCCAAAAC CCTTACCACC GAAAATCCCC GGAGGATGGC CGGTAATCGG CCATCTTTTC  
241 TACTTCGATA ACGAAGGCGA CGACCGTCCA TTAGCTCGGA GACTTAGCTG ATAAATACGG  
301 CCCCCTTTTC ACTTTTCGGC TAGGTCTTCC CCTTGTGCTA GTTGTAAAGCA GTTATGAAGC  
361 TATAAAGAT TGCTTCTCTA CAAATGACGC CATTTTCTCC AATCGTCCAG

**SEQ. ID. NO. 442**

1 MVFPIEAIIVG LVTFTFLLYF LWTKKSQKPP KPLPPKIPGG WPVIGHLFYF DNEGDDRPLA

**SEQ. ID. NO. 443**

D426-AA3

1 GGACCTTTGT TAGTACCACA TGAAAATGTA AAGGATTGTG TTGTTAGTGG ATATCACATT  
61 CCTAAAGGGA CTAGATTATT CGCAAACGTC ATGAAACTGC AGCGCGATCC TAAATTCTTG  
121 TCAAATCCTG ATAAGTTCGA TCCAGAGAGA TTCATCGCTG GTGATATTGA CTTCCGTGGT  
181 CACCACTATG AGTTTATCCC ATTTGGTCCT GGAAGACGAT CTTGTCCGGG GATGACTTAT  
241 GCATTGCAAG TGGAACACCT AACAATGGCA CATTTAATCC AGGGTTTCAA TTACAAAACCT  
301 CCAAATGACG AGCCCTTGGA TATGAAGGAA GGTGCAGGCA TAACTATACG TAAGGTAAAT  
361 CCTGTGGAAC TGATAATAGC GCCTCGCCTG GCACCTGAGC TTTATTAAAA CCTAAGATCA  
421 T

**SEQ. ID. NO. 444**

1 GPLLVPHENV KDCVVSGYHI PKGTRLFANV MKLQRDPKFL SNPDKFDPER FIAGDIDFRG  
61 HHYEFIPFGP GRRSCPGMTY ALQVEHLTMA HLIQGFNYKT PNDEPLDMKE GAGITIRKVN  
121 PVELIIAPRL APELY

**SEQ. ID. NO. 445**

D426-AG1

1 ATGACATTAT TGATAAACAA TCAAAATGCC TTGATGAAAG CACAAGAAGA GATAGACACA  
61 AAAGTTGGTA AGGATAGATG GGTAGAAGAG AGTGATATTA AGGATTTAGT ATACCTCCAA  
121 GCTATTGTTA AAAAGGTGTT ACGATTATAT CCACCAGGAC CTTTGTTAGT ACCACATGAA  
181 AATGTAAAGG ATTGTGTTGT TAGTGGATAT CACATTCCTA AAGGGACTAG ATTATTGCGA  
241 AACGTCATGA AACTGCAGCG CGATCCTAAA CTCTTGTCAA ATCCTGATAA GTTCGATCCA  
301 GAGAGATTCA TCGCTGGTGA TATTGACTTC CGTGGTCACC ACTATGAGTT TATCCCATT  
361 GGTCTGGAA GACGATCTTG TCCGGGGATG ACTTATGCAT TGCAAGTGGA ACACCTAACA  
421 ATGGCACATT TAATCCAGGG TTTCAATTAC AAGACTCCAA ATGGCGAGGC CTTGGATATG  
481 AAGGAAGGTG CAGGCATAAC AATACGTAAG GTAAATCCAG TGGAATTGAT AATAGCGCCT  
541 CGCCTGGCAC CTGAGCTTTA TTAATACCTA AGATCAT

**SEQ. ID. NO. 446**

1 MTLLINNQNA LMKAQEEIDT KVGKDRWVEE SDIKDLVYLQ AIVKKVLRLY PPGPLLVPH  
61 NVKDCVVSFY HIPKGTFLFA NVMKLQRDPK LLSNPDKFD PEFIAAGDIDF RGHYEFIPF  
121 GSGRRSCPGM TYALQVEHLT MAHLIQGFNY KTPNGEALDM KEGAGITIRK VNPVELIAP  
181 RLAPELY

**SEQ. ID. NO. 447**

D427-AA6

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1 GGATATCACA TTCCTAAAGG GACTAGATTA TTCGCAAACG TCATGAAACT GCAGCGCGAT
61 CCTAAACTCT TGTCAAATCC TGATAAGTTC GATCCAGAGA GATTCATCGC TGGTGATATT
121 GACTTCCGTG GTCACCACTA TGAGTTTATC CCATTGTTGTT CTGGAAGACG ATCTTGTCGG
181 GGGATGACTT ATGCATTGCA AGTGGAAACAC CTAACAATGG CACATTTAAT CCAGGGTTTC
241 AATTACAAAA CTCCAAATGA CGAGGCCTTG GATATGAAGG AAGGTGCAGG CATAACAATA
301 CGTAAGGTAA ATCCAGTGGA ATTGATAATA ACGCCTCGCT TGGCACCTGA GCTTTATTAA
361 AACCTAAGAT CATCTTGCTT G

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**SEQ. ID. NO. 448**

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1 GYHIPKGTRL FANVMKLQRD PKLLSNPDKF DPERFIAGDI DFRGHHYEFI PFGSGRRSCP
61 GMTYALQVEH LTMAHLIQGF NYKTPNDEAL DMKEGAGITI RKVNPVELII TPRLAPELY

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**SEQ. ID. NO. 449**

D427-AB6

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1 CGATTATATC CACCGGGACC TTTATTAGTA CCCCATGAAA ATGTAGAGGA TTGTGTTGTT
61 AGTGGATATC ACATTCCTAA AGGGACTAGA CTATTCGCGA ACGTTATGAA ATTACAGCGC
121 GATCCTAAAC TCTGGTCAAA TCCTGATAAG TTCGATCCAG AGAGATTTTT CGCTGCTGAT
181 ATTGACTTTC GTGGTCAACA CTATGAGTTT ATCCCATTTG GTTCTGGAAG ACGATCTTGT
241 CCGGGGATGA CTTATGCTAT GCAAGTGGAA CACCTAACAA TCGCACACTT GATCCAGGGT
301 TTCAATTACA AAATCCTAAA TGACGAGCCC TTGGATATGA AGGAAGGTGC AGGATTAAC
361 ATACGTAAGG TAAATCCTAT AGAAGTGGTA ATTACGCCTC GCCTGACACC TGAGCTTTAT
421 TAAAACCTAA GATCATCTTG CTTG

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**SEQ. ID. NO. 450**

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1 RLYPPGPLL V PHENVEDCVV SGYHIPKGTR LFANVMKLQR DPKLWSNPDK FDPERFFAAD
61 IDFRGQHYEF IPFGSGRRSC PGMTYAMQVE HLTIAHLIQG FNYKTPNDEP LDMKEGAGLT
121 IRKVNPIEVV ITPRLTPELY

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**SEQ. ID. NO. 451**

D428-AC9

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1 ATATCACATT CCTAAAGGGA CTAGATTATT CGCAAACGTC ATGAAACTGC AGCGCGATCC
61 TAAACTCTTG TCAAATCCTG ATAAGTTCGA TCCAGAGAGA TTCATCGCTG GTGATATTGA
121 CTTCCGTGGT CACCACTATG AGTTTATCCC ATTTGGTTCT GGAAGACGAT CTTGTCCGGG
181 GATGACTTAT GCATTGCAAG TGGAACACCT AACAATGGCA CATTTAATCC AGGGTTTCAA
241 TTACAAAACCT CCAAATGACG AGGCCTTGGA TATGAAGGAA GGTGCAGGCA TAACAATACG
301 TAAGGTAAAT CCAGTGGAAT TGATAATAAC GCCTCGCTTG GCACCTGAGC TTTATTAAAA
361 CCTAAGATCA TCTTGCTTG

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**SEQ. ID. NO. 452**

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1 YHIPKGTRLF ANVMKLQRDP KLLSNPDKFD PERFIAGDID FRGHHYEFIP FGSGRRSCPG
61 MTYALQVEHL TMAHLIQGFN YKTPNDEALD MKEGAGITIR KVNPELIIIT PRLAPELY

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**SEQ. ID. NO. 453**

D428-AH10

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1 GTGATACTGT CATAAAAGCA ACAGTGTTTA GTTTAGTCTT GGATGCTGCG GACACAGTTG
61 CTCTTCACAT GAATTGGGGA ATGGCATTAT TGATAAACAA TCAACATGCC TTGAAGAAAG
121 CGCAAGAAGA GATAGATAAA AAAGTTGGTA AGGATAGATG GGTAGAAGAG AGTGATATTA
181 AGGATTTGGT ATACCTCCAA ACTATTGTTA AAGAAGTGTT ACGATTATAT CCACCGGGAC
241 CTTTATTAGT ACCCATGAA AATGTAGAGG ATTGTGTTGT TAGTGATAT CACATTCCTA
301 AAGGGACTAG ACTATTCGCG AACGTTATGA AATTACAGCG CGATCCTAAA CTCTGGTCAA
361 ATCCTGATAA GTTCGATCCA GAGAGATTTT TCGCTGCTGA TATTGACTTT CGTGGTCAAC
421 ACTATGAGTT TATCCCATT

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**SEQ. ID. NO. 454**

1 DTVIKATVFS LVLDAADTV A LHMNWGMALL INNQHALLKA QEEIDKKVKG DRWVEESDIK  
 61 DLVYLQTIK EVLRLYPPGP LLVPHENVED CVVSGYHIPK GTRLFANVMK LQRDPKLWSN  
 121 PDKFDPERFF AADIDFRGQH YEFIPF

**SEQ. ID. NO. 455**

D429-AA1

1 ATAATGCTTT CTCCCATAGA AGCCATTGTA GGAGCAGTAA CCCTAATTAC ATTTCTCTTA  
 61 TACTTCCTAT GTACAAAAGA ATCTCAAAA CATTCAAAGC CCTTACCAAC GAAAATCCCC  
 121 GGAGGATGGC CGGTAATCGG CCATCTTTTC CACTTCAATA ACGACGGCGA CGACCGTCCA  
 181 TTAGCTCGAA AACTCGGAGA CTTAGCTGAT AAATACGGCC CCGTTTTTAC TTTTCGGCTA  
 241 GGTCTTCCCC TTGTGCTAGT TGTAAGCAGT TACGAAGCTT TAAAAGATTG CTTCTCTACA  
 301 AATGACGCCA TTTTCTCCAA TCGTCCAGCT TTTCTTTACG GCGAATACCT TGGCTACAAT  
 361 AATACAATGC TTTTCTTAGC AAATTA

**SEQ. ID. NO. 456**

1 MLSPIEIAIVG AVTLITFLLY FLCTKESQKH SKPLPTKIPG GWPVIGHLFH FNNDGDDRPL  
 61 ARKLGDLADK YGPVFTFRLG LPLVLVSSY EALKDCFSTN DAIFSNRPAF LYGEYLGYN  
 121 TMLFLAN

**SEQ. ID. NO. 457**

D430-AA3

1 AGAAAGCACA AGAAGAGATA GACACAAAAG TTGGCAAGGA TAGATGGGTA GAAGAGAGTG  
 61 ATATTAAGGA TTTGGTGTAC CTCCAAGCTA TTGTTAAAGA AGTGTTACGA TTATATCCAC  
 121 CGGGACCTTT GTTAGTACCA CATGAAAATA TAGAGGATTG TGTGTGTAGT GGATATTACA  
 181 TTTCTAAAGG GACTAGACTA TTCGCAAATG TTATGAAACT GCAGCGCGAT CCTAAACTCT  
 241 GGCCAAATCC TGATAATTTT GATCCAGAGA GATTGTGCG TGCAGGTATT GACTTTCGTG  
 301 GTCAGCATTA TGAGTATATC CCGTTTGGTT CTGGAAGACG ATCTTGTCG GGGATGACTT  
 361 ATGCATTGCA AGTGGAAACAC TTAACAATGG CACATTTGAT CCAGGGTTTC AATTACAGCA  
 421 CTCCAAATGA CGAGCCCTTG GATATGAAGG AAGGTGCAGG TATAACTATA CGTAAGGTAA  
 481 ATCCCGTGGA AGTGATAATT ATGCCTCGCC TGGCACCTGA GCTTTATTAA AACCTAAGAT  
 541 CTTTCATCTT GG

**SEQ. ID. NO. 458**

1 KAQEEIDTKV GKDRWVEESD IKDLVYLQAI VKEVLRLYPP GPLLVPHENI EDCVVSGYYI  
 61 SKGTRLFANV MKLQRDPKLW PNPDNFDPER FVAAGIDFRG QHYEYIPFGS GRRSCPGMTY  
 121 ALQVEHLTMA HLIQGFNYST PNDEPLDMKE GAGITIRKVN PVEVIIMPRL APELY

**SEQ. ID. NO. 459**

D431-AE6

1 ATAATGCTTT CTCCCATAGA AGCCATTGTA GGACTAGTAA CCTTCACATT TCTCTTCTAC  
 61 TTCTATGGA CAAAAAATC TCAAAAACCT TCAAAAACCT TACCACCGAA AATCCCCGGA  
 121 GGATGGCCGG TAATTGGCCA TCTTTTCCAC TTCAATGACG ACGGCAACGA CCGTCCATTA  
 181 GCTCGAAAAC TCGGAGACTT AGCTGACAAA TACGGCCCCG TTTTCACTTT TCGGCTAGGC  
 241 CTTCCCCTTG TGTTAGTTGT AAGCAGTTAC GAAGCTATAA AAGACTGTTT CTCTACAAAT  
 301 GATGCCATTT TCTCTAATCG TCCAGCTTTT CTTTACGGCG AATACCTTGG CTACAATAAT  
 361 GCCATGCTAT TTTTGGCAAA TTACGGACCT TACTGGCGAA AAAATCGTAA ATTAGTTATT  
 421 CAGGAAGTTC TCTCAGCTAG TCGTCTCAA AAATTCAAAC ACGTGAGATT CGCCAGAATT  
 481 CAAACGAGCA TTAAGAATTT ATACACTCGA ATTGATAGAA ATTCGAGTAC GATAAATTTA  
 541 ACTGATTGGT TAGAAGAATT GAATTTTGGT CTCATCGTGA AGATGATAGC TGGGAAAAAT  
 601 TATGATTCC

**SEQ. ID. NO. 460**

1 MLSPIEIAIVG LVTFTFLFYF LWTKKSQKPS KPLPPKIPGG WPVIGHLFHF NDDGNDRPLA  
 61 RKLGLADKY GPVFTFRLGL PLVLVSSYE AIKDCFSTND AIFSNRPAFL YGEYLGYNNA  
 121 MLFLANYGPY WRKNRKLVIQ EVLSASRLKK FKHVRFARIQ TSIKNLYTRI DRNSSTINLT  
 181 DWLEELNFGL IVKMIAGKNY DS

**SEQ. ID. NO. 461**

D113-AE9

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1 TTGATTTACA TGTTTGGTCA AGAACATAAA GACCATCGCC GTCGAATGGC CCCTAATTTT
61 ACCCCTAAAG CTCTTGCTAC TTACACTGTT ATCCAACAAA AGATTATTAT CAAACACTTT
121 CAGTCCTGGT TGGACGAAGC ATCCCAATCC CCTAACAAAC CAATCACACT TCGCCTCCTT
181 TGCCGCGATA TGAACCTGGA TACTTCCCAG ACTGTCTTCG TTGGTCCATA CTTAAACGAA
241 GATTCCAGAA AGCAGTTCAA TGTTGACTAC AATTACTTCA ATGTTGGGTT AATGAACTC
301 CCTGTTGATT TACCTGGTTT CGCCTTCAGA GATGCTAGGT TAGCTGTTGG GAGACTAGTC
361 GACACGCTTT CCGTTTGTGC AGCACAGAGC CAAATTAAGA TGGCAGGTGA CGAAGAACCC
421 ACTTGCTTGA TTGATTTTGG GATGCAGGAG AATTTTCAGAG AGATTACAGTA AGCTAAGATT
481 AATGGTTCAC AAAAGCCGTT TGAGTATACC AGTAAGCAAC TTGGTGGCTT CTTATTTGAC
541 TTCTCTTTTG CGGCTCAAGA TGCTTCTACT TCATCTCTGT TATGGGCAAT GGTGCTTTTG
601 GAATCTCACC CGCAAGTTCT GGAGAGAGTC CGAGCCGAAG TGGCGAAATT CTGGTCGCCA
661 GAATCTGAGG AGCAGCCGTT GACGGCGGAG ATGCTTAGGG AAATGAAGTA CCTGGAGGCG
721 GTGGCGCGTG AGGTTGTTAG GATCAGAACT CCGGCGGCTT TGGTGCCGCA CATTGCCGGC
781 GAAGAATTCC GGTAACTGA TGATTATGTT ATCCCAAAGG GGACTATTGT TTTCCCTTCG
841 GTTTTTGACT CGTCTTTCCA GGGGTTTCCT GAACCGGAGA AGTTTGACCC GGACCGGTC
901 ACAGAGGAGA GGCAAGAGGA ACGGGTTTAC AAGAAGAATT ATCTAGCAT TGGAGCTGGG
961 CCCCATGGAT GTGTGGGACA GAGGTATGCT ATAAACCATT TGATGCTCTT TATTGCTTGG
1021 TTCACGGCTC TGATTGATTT CAAGAGGCAC AAAACGGACG GCTGTGATGA TATCGCGTAT
1081 ATTCCAACCA TTGCTCCAAA GGATGATTGT AAAGTGTTCC TTTACAGAG GTGCACTCGA
1141 TTCCCATCTT TTTTCATGAAC TAATTGCACC TTTTATTTAA TTCTGATCCT CAAATTGGTC
1201 CCATTGGACC ATGGATGTAA TAGGACCAAT TGCAAGAATG GGGTCCAATG TATTTGTTCT
1261 TTCCATTTAT TTTTTTTT

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**SEQ. ID. NO. 462**

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1 LIYMFQGEHK DHRRRMAPNF TPKALATYTV IQQKIIKHF QSWLDEASQS PNKPITLRL
61 CRDMNLDTSQ TVFVGPYLNE DSRKQFNVDY NYFNVGLMKL PVDLPGFAFR DARLAVGRV
121 DTLSVCAQS QIKMRGDEEP TCLIDFWMQE NFREIQEAKI NGSQKPFYET SKQLGGFLFD
181 FLFAAQDAST SSLLWAMVLL ESHQVLERV RAEVAKFWSP ESEEQPLTAE MLREMKYLEA
241 VAREVVRIRT PAALVPHIAG EEFRLTDDYV IPKGTIVFPS VFDSSFQGF EPEKFDPDF
301 TEERQEERVY KKNYLAFGAG PHGCVGQRYA INHMLLFIAL FTALIDFKRH KTDGCDDIAY
361 IPTIAPKDDC KVFLSQRCTR FPSFS

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**SEQ. ID. NO. 463**

D114-AE12

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1 TCATTTTCAG TATGCTATGT TTTGTCTACT TGTGTTGATG TGTTTCGGGG ATAAGCTCGA
61 CGAGGCTCAA ATCAAACAAA TTGAAGGTGT TCAGCGCAGG TTGCTCCTGG GTTTCGACG
121 ATTCAATATA CTCAATTTCT TACCCAGAGT TGGGAAAATA ATCTTTAGGA ATCGCTGGAA
181 GGAAC TAATT GAACTACGTC AAGAGCAAGA GAAGATCTTC ATTCCTTTGA TTGAAGCTCG
241 AAGTATTAGG GCCAAAGAAC AAAAGCCTGA GGAAGAAGTG GTGGCTTATG TGGATACGCT
301 GTTGAATTTG GAATTGCCAG GGGAAAACAG GAGCCTCAAT TATGGGGAAA TGGTTAGCCT
361 CTGCAGTGAA TTCCTAAACG CCGGAACTGA TACGACGTCC ACCGCCTTAC AGTGGGTTAT
421 GGCCAACTTG GTCAAAACCC CTTCCATTCA GGGAAAAC TAATCAAGAAA TTGCTAGTGT
481 AGTGGGAGAG AAACAGAGCA AGTTGACAGA AGAGGTGGTA AAGGAGGAC ATCTGCATAA
541 AATGCCATAC TTGAGAGCAG TGATCTTTCT TAGGCGACAC CCGCTGGCT ACTTTGTGCT
601 GCCACATACG GTGACAGAGG AAGTAGAACT GAATGGCTAT GTTGTCCCGA AGAATGCCAC
661 CATCAATTTT ATGGTTGCAG ACATGGGTTT GGACCCAAAG GTGTGGGAGG ATCCCTTGGA
721 ATTCAAGCCA GAGAGGTTCT TAATGGAGGG ATCAGATAAG GAAGGGTTCG ATATAACAGG
781 AAGTAGAGAG ATCAAGATGA TGCCATTTGG CGCTGGTAGG AGAATTTGCC CAGGCTATGC
841 TTTGGCTATG CTTTCATCTAG AGTACTTTGT GGCTAATTTG GTTTGGCATT TTGCATGGGA
901 GGCTGTGGAG GGAGATGATG TTGATCTTTC AGAAAAGCTA GAATTCACCG TTGTGATGAA
961 GAATCCACTT CGAGCTCGTA TCTGCCTCAG AGTTAACTCT ATTTGAATTT GGTAATTACT
1021 AGTTCTTTCT ATTTGCATTG TTCCCTGTTG ATGGACTTCC CCCATATAGT ACTGGAAGTT
1081 AGAGGGAGAA TGATTATTAA TGCCTTGCTG CAATATTAGC TTAGTAGTTA GTAGTGAATA

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1141 TAATTGAAAC TGGATATTTT TATCTTATGT GTTGTACATT TGGTTCATTG CAAAGGGCGA  
1201 ATTC

**SEQ. ID. NO. 464**

1 HFQYAMFCLL VLMCFGDKLD EAQIKQIEGV QRRLLLGFRF FNILNPLPRV GKIIFRNRWK  
61 ELIELRQEQE KIFIPLIEAR SIRAKEQKPE EEVVAYVDL LNLELPGENR SLNYGEMVSL  
121 CSEFLNAGTD TTSTALQWVM ANLVKNPSIQ GKLYQEIASV VGEKQSKLTE EVVKEDDLHK  
181 MPYLRAVIFL RRHPPGHFVL PHTVTEEVEL NGYVVPKNAT INFMVADMGL DPKVWEDPLE  
241 FKPERFLMEG SDKEGFDITG SREIKMMPFG AGRRICPGYA LAMLHLEYFV ANLVWHFRWE  
301 AVEGDDVDLS EKLEFTVVMK NPLRARICLR VNSI

**SEQ. ID. NO. 465**

D119-AC3

1 ATAAATCTAA CTGATTGGTT AGAAGAATTG AATTTTGGTC TGATCGTGAA AATGATCGCT  
61 GGGAAAAATT ATGAATCCGG TAAAGGAGAT GAACAAGTGG AAAGATTTAA GAATGCGTTT  
121 AAGGATTTCA TGGTTTTATC AATGGAATTG GTATTATGGG ATGCATTTCC AATTCATTAA  
181 TTTAAATGGG TGGATTTTCA AGGTCATATT AAGGCAATGA AAAGGACATT TAAGGATATA  
241 GATTCGTGTT TTCAGAACTG GTTAGAGGAA CATATTAATA AAAGAGAAAA AATGGAGGTT  
301 AATGCAGAAG GGAATGAACA AGATTTTCATT GATGTGGTGC TTTCAAAAAT GAGTAATGAA  
361 TATCTTGGTG AAGGTTACTC TCGTGATACT GTCATTAAAG CAACGGTGTG TAGTTTGGTC  
421 TTGGATGCAG CAGACACAGT TGCTCTTCAC ATAAATTGGG GAATGGCATT ATTGATAAAC  
481 AATCAAAAAG CCTTGACGAA AGCACAAGAA GAGATAGACA CAAAAGTTGG TAAGGACAGA  
541 TGGGTAGAAG AGAGTGATAT TAAGGATTTG GTATACCTCC AAGCTATTGT TAAAGAAGTG  
601 TTACGATTAT ATCCACCAGG ACCTTTGTTA GTACCACACG AAAATGTAGA AGATTGTGTT  
661 GTTAGTGGAT ATCACATTCC TAAAGGGACA AGATTATTCTG CAAACGTCAT GAAACTGCAA  
721 CGTGATCCTA AACTCTGGTC TGATCCTGAT ACTTTTCGATC CAGAGAGATT CATTGCTACT  
781 GATATTGACT TTCGTGGTCA GTACTATAAG TATATCCCGT TTGGTTCTGG AAGACGATCT  
841 TGTCAGGGA TGAATTATGC ATTGCAAAGT GAACACTTAA CAATGGCACA TTTGATCCAA  
901 GGTTCATT ACAGAACTCC AAATGACGAG CCCTTGGATA TGAAGGAAGG TGCAGGCATA  
961 ACTATACGTA AGGTAAATCC TGTGGAAGT ATAATAACGC CTCGCTGGC ACCTGAGCTT  
1021 TATTAAAACC TAAGATGTTT CATCTTGTT GATCATTGTT TAATAC

**SEQ. ID. NO. 466**

1 INLTDWLEEL NFGLIVKMIA GKNYESGKGD EQVERFKNAF KDFMVLMEF VLWDAFPIPL  
61 FKWVDFQGHI KAMKRTFKDI DSVFQNWLEE HINKREKMEV NAEGNEQDFI DVVLSKMSNE  
121 YLGEYSRDT VIKATVFSLV LDAADTVLH INWGMALLIN NQKALTKAQE EIDTKVGKDR  
181 WVEESDIKDL VYLQAIKVEV LRLYPGPPL VPHENVEDCV VSGYHIPKGT RLFANVMKLQ  
241 RDPKLWSDPD TFDPERFIAT DIDFRGQYK YIPFGSGRRS CPGMTYALQV EHLTMAHLIQ  
301 GFNYRTPNDE PLDMKEGAGI TIRKVNVEL IITPRLAPEL Y

**SEQ. ID. NO. 467**

D132-AA5

1 ATGAGAATGG TAGCTGGAAG GAGATATTAT GGTGAAGAGG TAGATAACGA GGAGGCAAAC  
61 CATTTTCGGG AGCTTGTAAG AGAGGTTATT TCATATGGGG GTGCATCAAA TCCCACGGAT  
121 TCATGCCTG CAATATTTTC TTGCTTTTTC AGGAGTATGG AGAAGAATTT GGCCAGGCTT  
181 GGTAAGCAAA TGGACGCGCT CTTGCAAGGC TTGATTGATG AACACCGTCG TGATAAAAGC  
241 AGAAATTCCA TGATTGATCA TTTGCTTTCT CTGCAAGAAT CAGAACCAGA ATATTACTCT  
301 GATCAAATCA TCAAAGGAAT AATATTGGTC ATGCTGAATG CGGGGACTGA AACATCATCT  
361 GTAACAATAG AATGGGCAAT GTCTCTTTTA CTCAATCATC CAGAGGTGTT GGAAAAGGCC  
421 AAAGCTGAAA TAGACGACCA TGTGGGTAAA GATCGTTTAG TGGATGAAGC AGATTTACCC  
481 AAGCTGAAAT ACCTTCAAAG TATTATTTCA GAGACACTTC GATTGTACCC TGCAGGACCA  
541 ATGCTAGTGC CTCATGGATC ATCTGATGAT TGCATATCG CTGGGTTGCA CATTCCACGT  
601 GGCACGATGC TATTGGTGAA TGCTTGGGCC ATCCACAGGG ACCCATTACT TTGGGAGGAT  
661 CCAGAGAGCT TCAAGCCAGA AAGGTTTGAA GGTGTGCAAG TGGAAATCATG GAAGCTATTG  
721 CCATTTGGAA TGGGAAGGAG AGCGTGTCCA GGTCTGGAC TTGCTCAACG TGTGGTTGGT  
781 TTAGCTTTAG CATCTCTAGT GCAGTGTGTT GAGTGGAAAA GGGTAAGTGA AGAGGTGGTT  
841 GATTTGACTG AAGGAAAAGG TCTCACCATG CCAAAGCTG AGCCACTCAT GGCTAGGTGC

901 GAAGCTCGTG ATATTCTTCA CAAAGTTGTT TCAGAAATAT CCTAACGTTT CAGAGTGTTT  
 961 CTTGCATTTT TTTAGTGCTC CATACCTCTA GTTT

**SEQ. ID. NO. 468**

1 MRMVAGKRYV GEEVDNEEAN HFRELVEEVI SYGGASNPTD FMPAIFRCFF RSMEKNLRL  
 61 GSKMDALLQG LIDEHRRDKS RNSMIDHLLS LQESEPEYYS DQIIKGIILV MLNAGTETSS  
 121 VTIEWAMSL LNHPEVLEKA KAEIDDHVGK DRLVDEADLP KLKYLQSIIS ETLRLYPAGP  
 181 MLVPHGSSDD CTIAGLHIPR GTMLLVNAWA IHRDPLLWED PESFKPERFE GVQVESWKLL  
 241 PFGMGRRACP GSGLAQRVVG LALASLVQCF EWKRVSEEVV DLTEGKGLTM PKAEPLMARC  
 301 EARDILHKVV SEIS

**SEQ. ID. NO. 469**

D223-BB10

1 CTCCTTTGCC GCGATATGAA CTTGGATACT TCCCAGACTG TCTTCGTTGG TCCATACTTA  
 61 AACGAAGATT CCAGAAAAGCA GTTCAATGTT GACTACAATT ACTTCAATGT TGGGTTAATG  
 121 AAACCTCCCTG TTGATTTACC TGGTTTCGCC TTCAGAGATG CTAGGTTAGC TGTTGGGAGA  
 181 CTAGTCGACA CGCTTTCCGT TTGTGCAGCA CAGAGCCAAA TTAAGATGCG AGGTGACGAA  
 241 GAACCCACTT GCTTGATTGA TTTTGGATG CAGGAGAATT TCAGAGAGAT TCAGGAAGCT  
 301 AAGATTAATG GTTCACAAAA GCCGTTTGAG TATACCAGTA AGCAACTTGG TGGCTTCTTA  
 361 TTTGACTTCC TCTTTGCGGC TCAAGATGCT TCTACTTCAT CTCTGTTATG GGCAATGGTG  
 421 CTTTTGGAAT CTCACCCGCA AGTCTCGGAG AGAGTCCGAG CCGAAGTGGC GAAATTCTGG  
 481 TCGCCAGAAT CTGAGCAGCC GTTGACGGCG GAGATGCTTA GGGAAATGAA GTACCTGGAG  
 541 GCGGTGGCGC GTGAGGTTGT TAGGATCAGA ACTCCGGCGA CTTTGGTGCC GCACATTGCC  
 601 GGCGAAGAAT TCCGGTTAAC TGATGATTAT GTTATTCCAA AGGGGACTAT TGTTTTCCCT  
 661 TCGGTTTTTG ACTCGTCTTT CCAGGGGTTT CCTGAACCGG AGAAGTTTGA CCCGGACCGG  
 721 TTCACAGAGG AGAGGCAAGA GGAACGGGTT TACAAGAAGA ATTATCTAGC ATTTGGAGCT  
 781 GGGCCCCATG GATGTGTGGG ACAGAGGTAT GCTATAAACC ATTTGATGCT CTTTATTGCG  
 841 TTGTTACCGG CTCTGATTGA TTTCAAGAGG CACAAAACCG ACGGCTGTGA TGATATCGCG  
 901 TATATTCCAA CCATTGCTCC AAAGGATGAT TGTAAGTGT TCCTTTCACA GAGGTGCACT  
 961 CGATTCCCAT CTTTTTCATG AACTAATTGC GCCTTTTATT TAATTCTGAT CCTCAAATTG  
 1021 GTCCCATTTG

**SEQ. ID. NO. 470**

1 LLCRDMNLD TQTVFVGPYL NEDSRKQFNV DYNFNVGLM KLPVDLPFGA FRDARLAVGR  
 61 LVDTLVCAAA QSQIKMRGDE EPTCLIDFWM QENFREIQA KINGSQKPFY YTSKQLGGFL  
 121 FDFLFAAQDA STSSLLWAMV LLESHPVLE RVRAEVAKFW SPESEQPLTA EMLREMKYLE  
 181 AVAREVVIR TPATLVPHIA GEEFRLTDDY VIPKGTIVFP SVFDSSFQGF PEPEKFDPR  
 241 FTEERQEERV YKKNYLAFA GPHGCVGQRY AINHLMLFIA LFTALIDFKR HKTDGCDIA  
 301 YIPTIAPKDD CKVFLSQRCT RFPSFS

**SEQ. ID. NO. 471**

D245-AA8

1 GATCGTTTAG TGGATGAAGC AGATTTACCC AAGCTGAAAT ACCTTCAAAG TATTATTTCA  
 61 GAGACACTTC GATTGTACCN TGCAGCACCA ATGCTAGTGC CTCATGAATC ATCTGATGAT  
 121 TGCACGGTCG CTGGCTTCCA CATTCCCTCGT GGCACGATGC TATTGGTGAA TGCTTGGGCC  
 181 ATCCACAGGG ACCCCTTACT TTGGGAGGAC CCAGAGAGCT TCAAGCCAAA AAGGTTTGAA  
 241 GGTGTGCAAG CCGAATCATG GAAGCTATTG CCATTTGGAA TGGGAAGGAG AGCGTGCCCA  
 301 GGTCTGGAC TTGCTCAATG TGTGGTTGGT TTAGCTTTAG CAACTCTAGT GCAGTGTTTT  
 361 GAGTGAAAAA GGGTAAGCGA AGAGGTGGTT GATTGACGG AAGGAAAAGG TCTCACTATG  
 421 CCAAAACCCG AGCCACTCAT GGCTAGGTGC GAAGCTCGTG ACATTTTTC CAAAGTTCTT  
 481 TCAGAAATAT CTTAATGTTT TGGGAGTCTG AATTAATAAT GTAAAATGTA TTTTCATTTT  
 541 CTCATATAAT ATTGCACTAT CTACATTTCT GATATGTCAT TGAGATACTC CGG

**SEQ. ID. NO. 472**

1 DRLVDEADLP KLKYLQSIIS ETLRLYXAP MLVPHESSDD CTVAGFHIPR GTMLLVNAWA  
 61 IHRDPLLWED PESFKPKRFE GVQAESWKLL PFGMGRRACP GSGLAQCVVG LALATLVQCF  
 121 EWKRVSEEVV DLTEGKGLTM PKPEPLMARC EARDIFHKVL SEIS

**SEQ. ID. NO. 473**

D246-AE12

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1 GAGGACGATC TGCATAAAAT GCCATACTTG AGAGCAGTGA TCTTAGAGGG TCTTAGGCGA
61 CACCCGCCTG GTCACCTTGT GCTGCCACAT ACGGTGACAG AGGAAGTAGA ACTGAATGGC
121 TATGTTGTCC CGAAGAATGC CACCATCAAT TTCATGGTTG CAGACATGGG TTTGGACCCA
181 AAGGTGTGGG AGGATCCCTT GGAATTCAAG CCAGAGAGGT TCTTAATGGA GGGATCAGAT
241 AAGGAAGGGT TCGATATAAC AGGAAGTAGA GAGATCAAGA TGATGCCATT TGGCGCTGGT
301 AGGAGAATTT GCCCAGGCTA TGCTTTGGCT ATGCTTCATC TAGAGTACTT TGTGGCTAAT
361 TTGGTTTGGC ATTTTTCGATG GGAGGCTGTG GAGGGAGATG ATGTTGATCT TTCAGAAAAG
421 CTAGAATTCA CCGTTGTGAT GAAGAATCCA CTTCGAGCTC GTATCTGCCT CAGAGTTAAC
481 TCTATTTGAA TTTGGTAATT ACTAGTTCTT TCTATTTGCA TTGTTCCCTG TTGATGGACT
541 TCCCCCATAT AGTACTGGAA GTTAGAGGGA G

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**SEQ. ID. NO. 474**

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1 EDDLHKMPYL RAVILEGLRR HPPGHFVLPH TVTEEEVELNG YVVPKNATIN FMVADMGLDP
61 KVVWEDPLEFK PERFLMEGSD KEGFDITGSR EIKMMPFGAG RRICPGYALA MLHLEYFVAN
121 LVWHFRWEAV EGDDVDLSEK LEFTVVMKNP LRARICLRVN SI

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**SEQ. ID. NO. 475**

D279-AD1

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1 GCAGTGCTGA CTTGGCGTAC GAAGCTTTAA TTGAAAAGGG TCAAATTTTC GCTACCCGCC
61 GCAGTGAGAC CCCGACCCGA ACCATTTTCA GTTGCAACAA GTTCAGTGC AATGCAGCAA
121 TTTACGGGCC ACTTTGGCGA TCCCTGAGAA GAAATATGGT CCAAAATATG CTTAGTTCGA
181 GTAGAGTGAA AGAATTTTCG GATTGTAGAG AAATGGCAAT GGATAAGTTG ATTGAAAGGA
241 TACATGCAGA TGCTAAGGCC AATAACGATA TCGTTTGGGT GCTGAAAAAC GCGCGTTTCG
301 CGGTGTTTTA TATACTTTTG ACTATGTGTT TTGGTGTGTA AATGGATGAG AAAATGATTG
361 AAACCGTTGA TCAAATGATG AAGGATGTGC TAATGGAGCT TCATCCAAGA ATAGATGATT
421 TTCTTCCTAT ATTGAGCTTG TTTGTTGGTT ATAAACAACG TAAGAGAGTT CACGAAGTTC
481 GCAAGAGACA AATAGAAACA CTTGTCCCTT TGATCGAGAA ACGTCGAAGA GCAATACAAA
541 ATCTTGGGTA CGATAAGACA GTTGCTCGT TTTCTGACTT AGATACTTTA TTTGATGTTA
601 AGGTCGAAGG TACAAAAGTCA GGACCAACGA ATCCGGAGCT TGTAACACTA TGTTCAGAGT
661 TCTTGAATGG TGGGACCGAC ACAACCGCTA CCGCAATAGA GTGGGCCATA GGGAGAATGA
721 TCGAAAATCC AAGCATACAG AAGAGAATAT ACGAAGAGAT TAGAAATACA GTGGGTGACA
781 GAAAGATTGA CGAAAAGGAT ATGGATAAGA TGCCTTATTT AAACGCCGTT GTAAAGGAGC
841 TTTTACGTAA ACATCCTCCT ACGTACGTTA CATTTACCCA TGCAGTAACG GAGCCAACAA
901 CATTGGGTGG GTATGACATA CCCACATATG CTAATGTAGA GTTTTTTGTG CCCGGGATCT
961 CGGATGACCC GAAAGTTTGG TCTGATCCGG AAAAGTTTGA CCCGGATAGG TTTCTATCCG
1021 GGCGGGAGGA CGCTGATATA ACGGGTGTGA CCGGGGTAAA GATGATGCCA TTTGGGGTCCG
1081 GGCGGAGGAT TTGTCCGGGC TTGGGCTTGG CAACGGTGCA TGTGAATTTG ATGTTGGCCC
1141 GAATGATTCA AGAATTTGAA TGGTCCGCTT ACCCGGAAAA TAGGAAAGTG GATTTTACTG
1201 AGAAATTGGA ATTTACTGTG GTGATGAAAA ACCCTTTAAG AGCTAAGGTC AAGCCAAGAA
1261 TGCAAGTGGT GTAATTCATT AAGATTATAA GTCC

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**SEQ. ID. NO. 476**

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1 SADLAYEALI EKGQIFATRP SETPRTIFS CNKFSVNAAI YGPLWRSLLR NMVQNMLSSS
61 RVKEFRDCRE MAMDKLIERI HADAKANNDI VWVLKNARFA VFYILLTMCF GVEMDEKMIE
121 TVDQMMKDVL MELHPRIDDF LPILSLFVG Y KQRKRVHEVR KRQIETLVPL IEKRRRAIQN
181 PGYDKTVASF SYLDTLFDVK VEGTKSGPTN PELVTLCSEF LNGGTDTTAT AIEWAIGRMI
241 ENPSIQKRIY EEIRNTVGDR KIDEKMDKM PYLNAVVKEL LRKHPPTYVT FTHAVTEPTT
301 LGGYDIPTYA NVEFFVPGIS DDPKVVSDPE KFDPRFLSG REDADITGVT GVKMMPFGVG
361 RRICPGLGLA TVHVNLMRLAR MIQEFESAY PENRKVDFT E KLEFTVVMKN PLRAKVKPRM
421 QVV

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**SEQ. ID. NO. 477**

D282-AA10

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1 ACAGCATCTT GTGCTGCCAT AATAATTACT CTAGTGGTGT GTATATGGAG AGTGCTGAAT
61 TGGGTTTGGT TCAGACCAAA GAAGCTGGAA AAGCTACTGA GGAAACAAGG TCTCAAAGGC
121 AATTCCCTACA GGATTTTGTA TGGGGATATG AAGGAGCTTT CTGGTATGAT TAAGGAAGCT
181 AACTCCAAAC CCATGAATCT TTCTGATGAT ATTGCCCAA GATTGGTCCC TTTCTTTCTT
241 GATACCATCA AGAAATATGG GAAAAAATCC TTTGTATGGT TGGGTCCAAA ACCGCTGGTT
301 TTTGTCATGG ACCCCGAGCT TATAAAGGAA GTATTCTCCA AAAACTATCT GTATCAAAAG
361 CCTCATTCAA ATCCATTAAC CAAGTACTG GCACAAGGAC TTGTAAGCCA AGAGGAAGAC
421 AAATGGGCCA AACATAGAAA AATCGTCACT CCTGCCTTCC ACCTGGAGAA GCTAAAGGTT
481 TGTAATTGCA ATGGATTCTC CGTAAGCAGT TCATTTTAT CTTTCTTTC ATCGTAACAG
541 AAATTACTC TTGATTGTGA TTCTTTTGT AGGTACTTGT TTGGAACCAT TTTGTATTCC
601 TAATTACAAA GTCGGAACAT TTTGAATAAG TGTCCCTTCA TTGACTTCT CTTAACCATT
661 TCTTAAACAG CATATGCTTC CAGCTTTTGT TTTGAGCTGT ACTGAGATGC TTGACAAATG
721 GGAAGACATT GTTGCAGTTG AGGGCTCACA TGAGATAGAT ATATGGCCTG GCCTTCAACA
781 ATTAAGTAGT GATGTGATCT CTCGGACAGC CTTTGGCAGT AGCTATGAAG CAGGTAGAAG
841 GATATTTGAA CTTCAAAAGG AACAAGCTCA ATTTCTTATG GAAGCTATAC GCTCCGTTTA
901 TATTCCAGGC TGGAGGTTTT TGCCAACAAA GAGGAACAGA AGAATGAAGG AAATTGAAAA
961 GGATGTTCAA GCCTTAGTTA AAGGTATTAT TGATAAAAGA GTAAAGTCAA TGAAAGCAGG
1021 AGAGGTGAAT AATGAGGATC TGCTTGGTAT ATTGCTGGAA TCTAATTTTA AAGAAATTGA
1081 ACAGCATGGA AACAAGGATT TTGGAATGAG CATTGAAGAA GTCATTCAAG AATGCAAGTT
1141 ATTCTATTTT GCTGGCCAAG AACTACATC AGTGTGCTT GTATGGACT TAATATTGCT
1201 GAGCAGGCAT CAGGATTGGC AAGCACTGGC CAGAGAAGAG GTGTGCAAG TCTTTGGGAA
1261 TCAGAAACCA GATTTTGATG GATTAAATCG TCTAAAAATT GTTACAATGA TCTTGACGA
1321 GTCTTTAAGG CTCTATCCCC CAGTAGTGAC ACTTACCCGA AGGCCTAAGG AAGACACTGT
1381 ATTAGGAGAT GTATCTCTAC CAGCAGGTGT GTTAATCTCC TTACCAGTGA TCTTATTGCA
1441 TCACGACGAA GAGATATGGG GTAAAGATGC AAAGAAGTTC AAGCCAGAGA GATTGAGAGA
1501 TGGAGTCTCA AGTGCAACAA AGGGTCAAGT CACTTTTTTC CCATTACTT GGGGTCCCAG
1561 AATATGCATT GGACAAAATT TTGCCATGTT AGAAGCAAAG ACTACTTTGG CTATGATCCT
1621 ACAACGCTTC TCCTTTGAAC TGTCTCCATC TTATGCACAT GCTCCTCAGT CCATAATAAC
1681 TTTGCAACCC CAGTATGGTG CTCCACTTAT TTTGCATAAA ATATAGTTTA TTACTTGTA
1741 GTAGTGTCTC GTTTTATGTT AAGCATGAGT CCAAAATGTT AAGGCTTGTA GAAGTCAAA
1801 ATGGGAATGA ATCACTAGTG AATTCT

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**SEQ. ID. NO. 478**

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1 KQHMLPAFCL SCTEMLSKWE DIVAVEGSHE IDIWPGLOQL TSDVISRTAF GSSYEAGRRI
61 FELQKEQAQF LMEAIRSVYI PGWRFLPTKR NRRMKEIEKD VQALVKGIID KRVKSMKAGE
121 VNNEDLLGIL LESNFKEIEQ HGNKDFGMSI BEVIQECKLF YFAGQETTSV LLVWTLILLS
181 RHQDWQALAR EEVLQVFGNQ KPFDGDLNRL KIVTMILYES LRLYPVVT LTRPKEDTVL
241 GDVSLPAGVL ISLPVILLHH DEEIWKDAK KFKPERFRDG VSSATKGQVT FFPFTWGPRI
301 CIGQNFAMLE AKTTLAMILQ RFSFELSPSY AHAPQSIITL QPQYGAPLIL HKI

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**SEQ. ID. NO. 479**

D295-AA1

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1 CATCAACGAG CACAAGAAAA ATCTTGCAGC TGGCAAGAGT AATGGTGCAT TAGGAGGTGA
61 AGATCTAATT GATGTCCTAC TAAGACTTAA GAATGATACA AGTCTTCAAT TTCCCATCAC
121 CAACAACAGT ATCAAAGCTG TTATTGTTGA CATGTTTGCT GCCGGAACGG AAACCTCATC
181 AACAACAACGT GTATGGGCTA TGGCTGAAAT CATGAAGAAT CCAAGTGTAT TCACCAAAGC
241 TCAAGCAGAA GTGCGAGAAG CCTTTAGGGA CAAAGTATCT TTTGATGAAA ACGATGTGGA
301 GGAGCTGAAA TACTTAAAGT TAGTCATTAA AGAAACTTTG AGACTTCATC CACCCTCTCC
361 ACTTTTGGTC CCAAGAGAAT GCAGGGAAGA CACAGATATA AACGGCTACA CTATTCCTGC
421 GAAGACCAAA GTTATGGTTA ATGTTTGGGC ATTGGGAAGA GATCCAAAAT ATTGGGATGA
481 CGCCGAAAGC TTTAAGCCAG AGAGATTTGA GCAATGCTCT ATGGATTTTT TTGGTAATAA
541 TTTTGAGTTT CTTCCTTTTG GTGGTGGACG GAGAATTTGT CCTGGAATGT CATTGGTTT
601 AGCTAATCTT TACTTGCCAT TGGCCCAATT GCTGTATCAC TTCGACTGGA AACTCCCAAC
661 TGGAATCAAG CCAAGAGACT TGGACTTGAC TGAATTATCT GGAATAACTA TTGCTAGAAA
721 GGGTGACCTT TACTTAAATG CCACTCCTTA TCAACCGTCG AGACTAATTT AATATTGGCA

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781 TCAACTTTTT AAATTTTCTT CATCAACCTC ATTATTAATG TACAATAATC TTTCTTCTGT  
 841 TGTTGTAGGC TTTATCGATT TCCAATACAT GTATTCTTTA TTTAAAAATG TATCACATTC  
 901 CATGTATAAA AAAAAAAAAA

**SEQ. ID. NO. 480**

1 INEHKKNLAA GKSNGALGGE DLIDVLLRLK NDTSLQFPIT NNSIKAVIVD MFAAGTETSS  
 61 TTTVWAMAEM MKNPSVFTKA QAEVREAFRD KVSFDENDVE ELKYLKLVIK ETLRLHPPSP  
 121 LLVPRECREG TDINGYTIPA KTKVMNVNWA LGRDPKYWDD AESFKPERFE QCSMDFFGNN  
 181 FEFLPFGGGR RICPGMSFGL ANLYLPLAQL LYHFDWKLPT GIKPRDLDLT ELSGITIARK  
 241 GDLYLNATPY QPSRLI

**SEQ. ID. NO. 481**

D101A-AE2

1 AAATAATGGA TTATCATATT TCTTTCCATT TTCAAGCTCT TTTAGGGCTT TTAGCCTTTG  
 61 TGTTCTTGTC TATTATCTTA TGGAGAAGAA CACTCACTTC AAGAAAATTA GCCCCTGAAA  
 121 TCCCAGGGGC ATGGCCTATT ATAGGCCATC TTCGTCAGCT GAGTGGTACT GATAAGAATA  
 181 TCCCATTTCC CCGAATATTG GGCGCTTTGG CAGATAAATA TGGACCTGTC TTCACACTGA  
 241 GAATAGGGAT GTACCCCTAT TTGATTGTCA ACAATTGGGA AGCAGCTAAG GATTGTCTCA  
 301 CAACGCATGA TAAGGACTCC GCTGCCCCGAC CAACTTCTAT GGCTGGTGAA AGCATCGGGT  
 361 ACAAGTATGC GAGGTTTACT TATGCTAATT TTGGTCCTTA TTATAACCAA GTGCGCAAAC  
 421 TAGCCCTACA ACATGTACTC TCGAGTACTA AACTCGAGAA AATGAAACAC ATACGTGTTT  
 481 CTGAATTGGA AACTAGCATC AAAGAATTAT ATTCCTTGAC GCTGGGCAAA AACAACATGC  
 541 AAAAAGTGAA TATAAGTAAA TGGTTTGAAC AATTGACTTT AAACATAATC GTGAAGACAA  
 601 TTTGTGGCAA GAGATATAGC AACATAGAGG AGGATGAAGA GGCACAACGT TTCAGAAAGG  
 661 CATTTAAGGG CATCATGTTT GTTGTAGGGC AAATTGTTTT ATATGACGCA ATTCCATTCC  
 721 CATTGTTCAA ATACTTTGAT TTCCAAGGTC ATATACAATT GATGAACAAA ATTTATAAAG  
 781 ACTTAGATTC TATTCTTCAA GGATGGTTGG ATGATCATAT GATGAACAAG GATGTAAACA  
 841 ATAAGGATCA AGATGCCATA GATGCCATGC TTAAGGTAAC ACAACTTAAT GAATTCAAAG  
 901 CCTATGGTTT TTCTCAGGCC ACTGTGATCA AGTCGACAGT CTTGAGTTTG ATCTTAGATG  
 961 GAAATGACAC AACCCTGTG CATTGATAT GGGTAATGTC CTTATTACTG AACAAATCCAC  
 1021 ATGTTATGAA ACAAGGCCAA GAAGAGATAG ACATGAAAGT GGGTAAAGAG AGGTGGATTG  
 1081 AAGATACTGA CATAAAAAAT TTAGTGTACC TTCAGGCTAT CGTTAAAGAG ACATTGCGCT  
 1141 TGTATCCACC TGTTCTTTTT CTTTTACCAC ACGAAGCAGT GCAAGATTGT AAAAGTGACTG  
 1201 GTTACCACAT TCCTAAAGGT ACTCGTCTAT ATATCAATGC GTGGAAAGTA CATCGCGATC  
 1261 CTGAAATTTG GTCAGAGCCC GAAAAGTTTA TGCCCAATAG ATTCTTGACT AGCAAAGCAA  
 1321 ATATAGATGC TCGCGGTCAA AATTTTGAAT TTATACCGTT TGGTTCTGGG AGACGGTCAT  
 1381 GTCCAGGGAT AGGT

**SEQ. ID. NO. 482**

1 MDYHISFHFQ ALLGLLAFVF LSIILWRRTL TSRKLAPEIP GAWPIIGHLR QLSGTDKNIP  
 61 FPRILGALAD KYGPVFTLRI GMPYLVNWN WEAAKDCLTT HDKDSAARPT SMAGESIGYK  
 121 YARFTYANFG PYYNQVRKLA LQHVLSSTKL EKMKHIVSE LETSIKELYS LTLGKNMOK  
 181 VNISKWFEQL TLNIIIVKTIC GKRYSNIEED EEAQRFRKAF KGIMFVVGQI VLYDAIPFPL  
 241 FKYFDFQGHI QLMNKIYKDL DSILQGWLDD HMMNKDVNNK DQDAIDAMLK VTQLNEFKAY  
 301 GFSQATVIKS TVLSLILDGN DTTAVHLIIV MSLLLNNPHV MKQGQEEIDM KVGKERWIED  
 361 TDIKNLVYLQ AIVKETLRLY PPVPFLLPHE AVQDCKVTGY HIPKGTRLRYI NAWKVHRDPE  
 421 IWSEPEKFMP NRFLTISKANI DARGQNFEFI PFGSGRRSCP GIG

**SEQ. ID. NO. 483**

D108-AA4

1 AATAGGCCAA AATATATGGA AGGAGATATT GTTGATCTTT TGCTACAATT GAAGAAAGAA  
 61 CAATCAACAC CAATTGATCT TACTTTGGAG GATATAAAG GAATTCTCAT GAATGTGTTG  
 121 GTTGCAAGAT CAGACACTAG TGCAGCTGCT ACTGTTTGGG CAATGACAGC CTTGATAAAA  
 181 AATCCAAAAA CCATGAAAAA AGTTCAATCA GAAATCAGAA AATCAATAGG GAAGAAAGGA  
 241 ATTGTAAATG AAGAAGATGT CCAAAACATG CCTTATCTCA AAGCAGTGAT AAAGGAAATA  
 301 TTTAGATTGT ATCCACCAGT TCCACTTCTA GTTCCAAGAG AATCAATGGA AAAAACCATA  
 361 TTAGAAGGTT ATGAAATTCG GCCAGGAACC ATAGTTCATG TTAACGCTTG GGCTATTGCG

421 AGGGATCCTG AAATATGGGA AAATCCAGAA GAATTTATAC CTGAGAGATT ACTTGAATAG

**SEQ. ID. NO. 484**

1 NRPKYMEGDI VDLLLLQLKKE QSTPIDLTLE DIKGILMNVL VAGSDTSAAA TVWAMTALIK  
61 NPKTMKKVQS EIRKSIGKKG IVNEEDVQNM PYLKAVIKEI FRLYPFVPLL VPRESMEKTI  
121 LEGYEIRPGT IVHVNAWAIA RDPEIWIENPE EFIPERLLE

**SEQ. ID. NO. 485**

D124-AC5 (5')

1 GCAAGTTCTT TCACTAGTTG TAATAGTCCT ATACATTCTT CAACAATTAC ACAACAAATT  
61 CATGAAAAAG AAAAAGAAAC TTCCTCCAGG TCCAAAAGGG TTTCCAATTA TTGGAAATCT  
121 ATTTATGATT GGCAAAAACC TACATCAAGA TCTTTATCAA ATAGCCAAAA AACATGGTCC  
181 TATAATGAGT ATGAGATTTG GTCTAGTTCC TATCATTGTT GCTTCATCTC CTCATGCTGC  
241 TGAACATATC TTGAAAAAAC ATGATCTTGT TTTTGCTAGT AGACCATATA ATACAGCTGC  
301 TCAATATATT GGATATAATC AAAGAAATCT TACTTTTGGT AAATATGGTC CTTATTGGCG  
361 AAATATGCGA AAATTATGTA CGTTAGAATT GCTTAGTAGT CTCAAGATCA ATTCATTTC  
421 GGCCATGAGA AAACAAGAAA TTGGAAATTT TGTGACTTTT CTCAATAGAG CAGCTTCTAA  
481 TGGTATTGAG GTTGATATTA GTGCTAAACT TGCTTCATTA AGTGCAAATA TGGCTTGTTT  
541 AATGGTATTT GGAAGAAAT ATATGGATGA AGAATTTGAT GAAAGGGGTT TTAAGATGT  
601 AATCAAGAG ACATTAGTTA TAACTGCAAC ACCAAATATT GGTGAGTTT TCTCTTTCT  
661 TGATAGGTTT GATTGTCAGG GATTGTGTCC ACGTATGAAA AAATTGGCAA AGATTTTGA  
721 TGATTTTTC GAGAAA

**SEQ. ID. NO. 486**

1 QVLSLVVIVL YILQQLHNKF MKKKKKLPPG PKGFPIIGNL FMIGKNLHQD LYQIAKKHGP  
61 IMSMRFGVLP IIVASSPHAA ELFLKKHDLV FASRPYNTAA QYIGYNQRNL TFGKYGPYWR  
121 NMRKLCTLEL LSSLKINSFQ AMRKQEIGNF VTFLNRAASN GIEVDISAKL ASLSANMACL  
181 MVFGKKYMD EFDERGFKDV IQETLVITAT PNIGEFFPFL DRFDLQGFVP RMKKLAKIFD  
241 DFFEK

**SEQ. ID. NO. 487**

D124-AC5 (3')

1 CGTGAATCCA TTGAAGATTG TATTGTTGAT GGTTTTGATA TACCTAAAGG TTCAAGAATT  
61 TTAGTAAATA CTTGGGCAAT TGGAAGAGAT CCAGAAGCCT GGCCCGAACC CGAGAAGTTC  
121 AAGCCAGAAA GGTGTGTTGG TAGCAACATC GATCTTAGGG GACGTGATTT TCAACTTTTA  
181 CCATTTGGCT CAGGGAGAAG GAGTTGCCCC GGATTACAAT TAGGGCTCAC CATTGTTGCG  
241 TTGGTGTTAG CGCAATTGGT TCATTGCTTT GATTGGGAAC TACCAATGG TATGGCGCCA  
301 GAAGATTTAG ATATGACTGA GAAATTTGGT TTAGTTACAG CTAGAGCTCA ACATTTAGTT  
361 GCTATTCCTA CTTATCAATT GCATGTGTAG TTGATGTGAA TCTTCCTAGA AGCTTAATTA  
421 AGTAAAAATG AAGATCTTTG TCCTCTATAT TTTTCATTGT ATGACAAAAT TTGGTAACAT  
481 TTACTACATA TGGAGCTACC ACTAAAAA

**SEQ. ID. NO. 488**

1 RESIEDCIVD GFDIPKGSRI LVNTWAIGRD PEAWPEPEKF KPERFVGSNI DLRGRDFQLL  
61 PFGSGRRSCP GLQLGLTIVR LVLAQLVHCF DWELPNGMAP EDLDMTEKFG LVTARAQHLV  
121 AIPTYQLHV

**SEQ. ID. NO. 489**

D141-AD7

1 TCGACGACTA TAATTTGGGC ATTAGCTGAA ATGATGAAGA AACCAAGTGT TTTAGCAAAG  
61 GCACAAGCTG AAGTAAGGCA AGCTTTGAAG GAGAAAAAAG GTTTTCAACA GATTGATCTT  
121 GATGAGCTAA AATATCTCAA GTTAGTAATC AAAGAAACCT TAAGAATGCA CCCTCCAATT  
181 CCTCTATTAG TTCCTAGAGA ATGTATGGAG GATACAAAGA TTGATGGTTA CAATATACCT  
241 TTCAAAACAA GAGTCATAGT TAATGCATGG GCAATCGGAC GAGATCCAGA AAGTTGGGAT  
301 GACCCCGAAA GCTTTATGCC AGAGAGATTT GAGAATAGTT CTATTGACTT TCTTGAAAT  
361 CATCATCAGT TTATACCATT TGGTGCAGGA AGAAGGATTT GTCCGGGAAT GCTATTTGGT  
421 TTAGCTAATG TTGGACAACC TTTAGCTCAG TTACTTTATC ACTTCGATTG GAACTCCCT

481 AATGGACAAA GTCATGAGAA TTTCGACATG ACTGAGTCAC CTGGAATTTT TG

**SEQ. ID. NO. 490**

1 STTIWALAE MMKKPSVLAK AQAQEVRLAK EKKGFQQIDL DELKYLKLV I KETLRMHPPI  
61 PLLVPRECE DTKIDGYNIP FKTRVIVNAW AIGRDPESWD DPESFMPERF ENSSIDFLGN  
121 HHQFIPFGAG RRICPGMLFG LANVGQPLAQ LLYHFDWKLP NGQSHENFDM TESPGIS

**SEQ. ID. NO. 491**

D148-AD1

1 TGCTCTTTCT ACTCTTTGTA GCCCTTCCTT TCATTCTTAT TTTTCTTCTT CCTAAAATTCA  
61 AAAATGGTGG AAATAACAGA TTGCCACCAG GTCTTATAGG TTTACCATTG ATTGGAAATT  
121 TGCATCAATA CGATAGTATA ACTCCTCATA TCTATTTTTG GAAACTTTCA AAAAAATATG  
181 GCAAAATCTT CTCATTAAAA CTTGCTTCTA CTAATGTGGT AGTAGTTTCT TCAGCAAAAT  
241 TAGCAAAAGA AGTATTGAAA AAACAAGATT TAATATTTTG TAGTAGACCA TCTATTCTTG  
301 GCCAACAAAA ACTGTCTTAT TATGGTCGTG ATATTGCTTT TAATGATTAT TGGAGAGAAA  
361 TGAGAAAAAT TTGTGTTCTT CATCTTTTAA GTTTAAAAAA AGTTCAATTA TTTAGTCCAA  
421 TTCGTGAAGA TGAAGTTTTT AGAATGATTA AGAAAAATC AAAACAAGCT TCTACTTCAC  
481 AAATATTAA TCTGAGTAAT TTAATGATTT CATTAACAAG TACAATTATT TGTAGAGTTG  
541 CTTTGGTGT TAGGATTGAA GAAGAAGCAC ATGCAAGGAA GAGATTTGAT TTTCTTTTGG  
601 CCGAGGCACA AGAATGATG GCTAGTTTCT TTGTATCTGA TTTTTTCCC TTTTAAAGTT  
661 GGATTGATAA ATTAAGTGGA TTGACATATA GACTTGAGAG GAATTTCAAG GATTTGATA  
721 ATTTTTATGA AGAATCATT GAGCAACATC AAAATCCTAA TAAGCCAAAA TATATGGAAG  
781 GAGATATTGT TGATCTTTTG CTACAATTGA AGAAGAGAA ATTAACACCA CTTGATCTCA  
841 CTATGGAAGA TATAAAAGGA ATTCTCATGA ATGTGTTAGT TGCAGGATCA GACACTAGTG  
901 CAGCTGCTAC TGTTTGGGCA ATGACAGCCT TGATAAAGAA TCCTAAAGCC ATGGAAAAAG  
961 TTCAATTAGA AATCAGAAAA TCAGTTGGGA AGAAAGGCAT TGTAATGAA GAAGATGTCC  
1021 AAAACATCCC TTATTTTAAA GCAGTGATAA AGGAAATATT TAGATTGTAT CCACCAGCTC  
1081 CACTTTTAGT TCCAAGAGAA TCAATGGAAA AAACCATATT AGAAGGTTAT GAAATTCGGC  
1141 CAAGAACCAT AGTTCATGTT AACGCTTGGG CTATAGCAAG GGATCCTGAA ATATGGGAAA  
1201 ATCCAGATGA ATTTATACCT GAGAGATTTT TGAATAGCAG TATCGATTAC AAGGGTCAAG  
1261 ATTTTGGGTT ACTTCCATTT GGTGCAGGCA GAAGAGGTTG CCCAGGTATT GCACTTGGGG  
1321 TTGCATCCAT GGAACCTGCT TTGTCAAATC TTCTTTATGC ATTTGATTGG GAGTTGCCCT  
1381 ATGGAGTGAA AAAAGAAGAC ATCGACACAA ACGTTAGGCC TGGAAATTGCC ATGCACAAGA  
1441 AAAACGAAT TTGCCTTGTC CCAAAAAATT ATTTATAAAT TATATTGGGA CGTGGATCTC  
1501 ATGCTAGTTC TGTGAAGG

**SEQ. ID. NO. 492**

1 LFLFLVALPF ILIFLLPKFK NGGNNRLPPG PIGLPPFIGNL HQYDSITPHI YFWKLSKKYG  
61 KIFSLKLAST NVVVVSSAKL AKEVLKKQDL IFCSRPSILG QQKLSYYGRD IAFNDYWREM  
121 RKICVLHLFS LKKVQLFSPI REDEVFRMIK KISKQASTSQ IINLSNLMIS LTSTIICRVA  
181 FGVRIEEEAH ARKRFDLLA EAQEMMASFF VSDFFPFLSW IDKLSGLTYR LERNFKDLN  
241 FYEELIEQHQ NPNKPKYMEG DIVDLLLQLK KEKLTPLDLT MEDIKGILMN VLVAGSDTSA  
301 AATVWAMTAL IKNPKAMEKV QLEIRKSVGK KGIVNEEDVQ NIPYFKAVIK EIFRLYPAP  
361 LLVPRESMEK TILEGYEIRP RTIVHVNWA IARDPEIWEN PDEFIPERFL NSSIDYKQD  
421 FGLLPFGAGR RGCPIALGV ASMELALSNL LYAFDWELPY GVKKEDIDTN VRPGIAMHKK  
481 NELCLVPKNY L

**SEQ. ID. NO. 493**

D212-BC11

1 CTCATTATCC ATCACCTAAA ATGGAGAATT CTTGGGTTTT TCTAGCCTTG GCAGGGCTAT  
61 CTGCATTAGC TTTTCTCTGT AAAATAATCA CCTGTCTGAG ACCGGTTAAC CGGAAAATAC  
121 CACCAGGTCC AAAACCATGG CCCATCATTG GCAATTTGAA CCTACTTGGT CCTATACCAC  
181 ATCAATCTTT TGACTTGCTT TCCAAAAAAT ATGGAGAGTT GATGCTGCTT AAATTTGGCT  
241 CCAGGCCAGT TCTTGTTGCT TCATCTGCTG AAATGGCAAA ACAGTTTTTA AAAGTACATG  
301 ATGCTAATTT CGCCTCCCGT CCTATGCTAG CTGGTGGAAA GTATACAAGC TATAACTATT  
361 GTGACATGAC ATGGGCACCC TATGGTCCCT ATTGGCGCCA AGCACGACGA ATTTACCTTA

421 ACCAGATATT TACTCCGAAA AGGCTAGACT CGTTCGAGTA CATTCTGTGT GAAGAAAGGC  
 481 AGGCCTTGAT TTCCCAGCTG AATTCCTTG CTGGAAAGCC ATTTTCTC AAAGACCATT  
 541 TGTCGCGATT TAGCCTCTGC AGCATGACAA GGATGGTTTT GAGCAACAAG TATTTTGGTG  
 601 AATCAACAGT TAGAGTAGAA GATTTGCAGT ACCTGGTAGA TCAATGGTTC TTACTTAATG  
 661 GTGCTTTCAA CATTGGAGAT TGGATTCCAT GGCTCAGCTT CTTGGACCTA CAAGGCTATG  
 721 TGAAACAAAT GAAGGCTTTG AAAAGAACTT TTGATAAGTT CCACAACATT GTGCTAGATG  
 781 ATCACAGGGC TAAGAAGAAT GCAGAGAAGA ACTTTGTCCC AAAAGACATG GTTGATGTCT  
 841 TGTGAAGAT GGCTGAAGAT CCTAATCTGG AAGTCAAAC CACTAATGAC TGTGTCAAAG  
 901 GGTTAATGCA GGATTTACTA ACTGGAGGAA CAGATAGCTT AACAGCAGCA GTGCAATGGG  
 961 CATTTCAAGA ACTTCTTAGA CAGCCAA

**SEQ. ID. NO. 494**

1 MENSWFALAL AGLSALAFLC KIITCRRPVN RKIPPGPKPW PIIGNLNLG PIPHQSFDDL  
 61 SKKYGELMLL KFGSRPVLVA SSAEMAKQFL KVHDANFASR PMLAGGKYTS YNYCDMTWAP  
 121 YGPYWRQARR IYLNQIFTPK RLDSFEYIRV EERQALISQL NSLAGKPFLL KDHLRSFSLC  
 181 SMTRMVLNKK YFGESTVRVE DLQYLVQWF LLNGAFNIGD WIPWLSFLDL QGYVKQMKAL  
 241 KRTEFKFHNI VLDDHRAKKN AEKNFVPKDM VDVLLKMAED PNLEVKLNTD CVKGLMQDLL  
 301 TGGTDSLTA VQWAFQELLR QP

**SEQ. ID. NO. 495**

D217-AB10

1 ATGATCGCTG GGAAAAATTA TGGATCCGGT AAAGGAGATG AACAAGTGGA GAGATTTGGG  
 61 AAAGCGTTTA AGGATTTTAT AATTTTATCA ATGGAGTTTG TGTTATGGGA TGCTTTTCCA  
 121 ATTCCATTGT TCAAATGGGT GGATCTTCAA GGCCATGTTA AGGCCATGAA AAGGACATTT  
 181 AAGGATATAG ATTCTGTTTT TCAGAATTGG TTAGAGGAAC ATGTCAAGAA AAAAGAAAAA  
 241 ATGGAGGTTA ATGCAGAAGG AAATGAACAA GATTTTCATTG ATGTGGTGCT TTCAAAAATG  
 301 AGTAATGAAT ATCTTGATGA AGGCTACTCT CGTGATACTG TCATAAAAGC AACAGTGTTT  
 361 AGTTTAGTCT TGGATGCTGC GGACACAGTT GCTCTTCACA TGAATTGGGG AATGGCATT  
 421 TTGACAAACA ATCAACATGC CTTGAAGAAA GCGCAAGAAG AGATAGATAA AAAAGTTGGT  
 481 AAGGATAGAT GGGTAGAAGA GAGTGATATT AAGGATTTGG TATACCTCCA AACTATTGTT  
 541 AAAGAAGTGT TACGATTATA TCCACCGGGA CCTTTATTAG TACCCCATGA AAATGTAGAG  
 601 GATTGTGTTG TTAGTGATA TCACATTCCT AAAGGGACTA GACTATTTCG GAACGTTATG  
 661 AAATTACAGC GCGATCCTAA ACTCTGGTCA AATCCTGATA AGTTCGATCC AGAGAGATTT  
 721 TTCGCTGCTG ATATTGACTT TCGTGGTCAA CACTATGAGT TTATCCCAT TGGTCTGGA  
 781 AGACGATCTT GTCCGGGGAT GACTTATGCA ATGCAAGTGG AACACCTAAC AATCGCACAC  
 841 TTGATCCAGG GTTTCAATTA CAAAACCTCA AATGACGAGC CCTTGGATAT GAAGGAAGGT  
 901 GCAGGATTAA CTATACGTAA GGTAAATCCT ATAGAAGTGG TAATTACGCC TCGCTGACA  
 961 CCTGAGCTTT ATTAAAATCT

**SEQ. ID. NO. 496**

1 MIAGKNYGS KGEQVERFG KAFKDFIILS MEFVLWDAFP IPLFKWVDLQ GHVKAMKRTF  
 61 KDIDSVFQNW LEEHVKKKEK MEVNAEGNEQ DFIDVVLKSM SNEYLDEGYS RDTVIKATVF  
 121 SLVLDAADTV ALHMNWGMAL LTNNQHALLK AQEEIDKKVG KDRWVEESDI KDLVYLQITV  
 181 KEVLRLYPPG PLLVPHEVVE DCVVSQYHIP KGTRLFANVM KLQRDPKLWS NPDKFDPERF  
 241 FAADIDFRGQ HYEFIFFGSG RRSCPGMTYA MQVEHLTIAH LIQGFNYKTP NDEPLDMKEG  
 301 AGLTIRKVN P EVVITPRLT PELY

**SEQ. ID. NO. 497**

D220-BC6

1 GCAGTGATCT TAGAAGGTCT TAGGCGACAC CCGCCCGGTC ACTTTGTGCT GCCACATACG  
 61 GTGACAGAGG AAGCAGAACT GAACGGCTAC GTCGTCCCAA AGAATGCCAC CATCAATTTT  
 121 ATGGTTGCCG ACATGGGTTT GGACCCAAAG GTGTGGGAGG ATCCCTTGGA ATTTAAGCCA  
 181 GAGAGGTTCT TAATGGAGGG ATCAGATAAG GAAGGGTTTG ATATAACAGG AAGTAGAGAG  
 241 ATCAAGATGA TGCCATTTGG AGCTGGTAGG AGAATATGTC CTGGCTATGC TTTGGCTATG  
 301 CTTCAATTTG AATACTTTGT GGCTAATTTG GTTTGGCATT TTCGATGGGA TGCTGTGGAG  
 361 GGAGATGATG TTGATCTTTC AGAGAAGCTA GAATTCACCG TTGTGATGAA GAATCCTCTA

421 CGAGCTCGTA TCTGCCCTAG AGTTAACTCT GTTTGAATTT GGTAATTACT AGTAGTTCTT  
 481 TCTATTTGCA TTGTTCCCTG TTGATGGACT TCC

**SEQ. ID. NO. 498**

1 AVILEGLRRH PPGHFVLPHT VTEEAELNGY VVPKNATINF MVADMGLDPK VWEDPLEFKP  
 61 ERFLMEGSDK EGFDITGSRE IKMMPFGAGR RICPGYALAM LHLEYFVANL VWHFRWDAVE  
 121 GDDVDLSEKL EFTVVMKNPL RARICPRVNS V

**SEQ. ID. NO. 499**

D225-AG9

1 TTCGCATGGA TAGGCCCGAGA ACCCAGGATT TTCGTAATGA AACCAGAATT GATAAAGGAA  
 61 ATAGTAACGA ACAACACCAT CTTCAAAAAA CCAAAACCAG CCCCACTTGT CCAGCTTCTT  
 121 GTTAGTGGCA TCTCAAGTTA TGAGGACGAC AAATGGGCTA AGCACAGAAA AATTCTTAAC  
 181 ACTGCATTTT ACGCCGAGAA GTTGAAGTGT ATGCTGCCGG CAATGCACAC AAGCTGTGAA  
 241 GATATGATCA ACAAGTGGGA AATTCTACTC TCCGAAAACA AATCCTGCGA ATTGGACGTG  
 301 CATCCATATT TTGAAGATTT TACCAGTGAT GTGATTTCAA GAACAGCATT TGGGAAGTAGT  
 361 TATGCAGAAG GAACAAGAAT ATTTTCATCTT CAAAAAGAAC TAGCTGAACT CACACGCCA

**SEQ. ID. NO. 500**

1 FAWIGPEPRI FVMKPELIKE IVTNNTIFKK PKPAPLVQLL VSGISSYEDD KWAKHRKILN  
 61 TAFYAEKLLK MLPAMHTSCE DMINKWEILL SENKSCELDV HPYFEDFTSD VISRTAFGSS  
 121 YAEGTRIFHL QKELAELTR

**SEQ. ID. NO. 501**

D231-AF1

1 ATGAGTTTATG TAAAATCAGT AGTGTATGAA GTATTAAGAA TTGAACCTCC AGTTCCATTC  
 61 CAATATGGTA AAGCCAAAGA AGATATCATA ATCCAAAGCC ATGATTCAAC TTTCTTAGTC  
 121 AAGAAAGGTG AAATGATCTT TGGATATCAG CCTTTTGCTA CAAAAGATCC AAAGATTTTT  
 181 GACAAACCAG AGGAGTTTAT TCCGGAGAGG TTCATGGCCG AAGGGGAAAA ATTATTAAAG  
 241 TATGTGTATT GGTCAAATGC AAGAGAGACA GATGATCCAA CGGTGGACGA CAAACAATGC  
 301 CCAGCGAAAA ATCTTGTCGT GCTTTTGTGC AGGTTGATGT TGGTGGAGGT TTTTCATGCGT  
 361 TACGACACAT TCACAGTGGG GTCAACAAAG CTCTTTCTTG GGTTCATCAGT AACGTTACAG  
 421 ACTCTGGAAA AAGCGACATG AGTTTCAGAT ATCTTAATTG TAGGCTGCAA ATAATAATGT  
 481 GGTCATTCTG CAAATTATTG TACTTGTGCT GATGTACTTG ACTTCGAGTG GATATAATAA  
 541 TGCCTGTTT TTAGAAA

**SEQ. ID. NO. 502**

1 MSLVSVVYE VLRIEPPVPF QYGKAKEDII IQSHDSTFLV KKGEMIFGYQ PFATKDPKIF  
 61 DKPEEFIPER FMAEGEKLK YVWSNARET DDPTVDDKQC PAKNLVLLC RLMLVEVFM  
 121 YDTFTVESTK LFLGSSVTFT TLEKAT

**SEQ. ID. NO. 503**

D232-AH5

1 GTTGGAACAA GTAGTTGGCA CAAACAGAAAT GGTGGAAGAA TCAGATTTGG AAAAATTAGA  
 61 TACTTAGAT ATGGTTGTAA AAGAAGGTTT TAGGCTTCAC CCTGTTGCAC CACTATTACT  
 121 TCCTCGTGAA TCCATTGAAG ATTGTATTGT TGATGGTTTT GATATACCTA AAGGTTCAAG  
 181 AATTTTAGTA AATACTTGGG CAATTGGAAG AGATCCAGAA GCCTGGCCCCG AACCCGAGAA  
 241 GTTCAAGCCA GAAAGGTTTG TTGGTAGCAA CATCGATCTT AGGGGACGTG ATTTTCAACT  
 301 TTTACCATT TGGCTCAGGA GAAGGAGTTG CCCCAGGATTA CAATTAGGGC TCACCATTGT  
 361 TCGCTTGGTG TTAGCGCAAT TGGTTCATT

**SEQ. ID. NO. 504**

1 LEQVVGTRM VEESDLEKLD YLDMVVKEGF RLHPVAPLLL PRESIEDCIV DGFDPKGS  
 61 ILVNTWAIGR DPEAWPEPEK FKPERFVGSN IDLRGRDFQL LPFGSGRRSC PGLQLGLTIV  
 121 RLVLAQLVH

**SEQ. ID. NO. 505**

D240-BB8

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1 CTATATGGAG ACACAAAGGA GATGGCTGAG ATGACCAAAG AAGCCAAGTT TAAACCCATT
61 AAACCTCACTG ATGATATTCT CCCTCGGATC TTCCCTTTCT ACCATCATAC TTTCAACAAA
121 TATGGTAACC ATTGTTTCGC ATGGATAGGC CCAGAACCCA GGATTTTCGT AATGAAACCA
181 GAATTGATAA AGGAAATAGT AACGAACAAC ACCATCTTCA AAAAACCAAA ACCAGCCCCA
241 CTTGTCCAGC TTCTTGTTAG TGGCATCTCA AGTTATGAGG ACGACAAATG GGCTAAGCAC
301 GGAAAAATTC TTAACACTGC ATTTTACGCC GAGAAGTTGA AGTGTATGCT GCCGGAATG
361 CACACAAGCT GTGAAGATAT GATCAACAAG TGGGAAATTC TACTC

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**SEQ. ID. NO. 506**

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1 LYGDTKEMAE MTKEAKFKPI KLTDDILPRI FPFYHHTFNK YGNHCFAWIG PEPRI FVMKP
61 ELIKEIVTNN TIFKKPKPAP LVQLLVSGIS SYEDDKWAKH GKILNTAFYA EKLKCMPLAM
121 HTSCEDMINK WEILL

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**SEQ. ID. NO. 507**

D280-AA6

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1 TACGTACGTT ACATTTACCC ATGCAGTAAC GGAGCCAACA ACATTGGGTG GGTATGACAT
61 ACCCACATAT GCTAATGTAG AGTTTTTTGT ACCCGGGATC TCGGATGACC CGAAAGTTTG
121 GTCTGATCCG GAAAAGTTTG ACCCGGATAG GTTCTATCC GGGCGGGAGG ACGCTGATAT
181 AACGGGTGTG ACCGGGGTAA AGATGATGCC ATTTGGGGTC GGGCGGAGGA TTTGTCCGGG
241 CTTGGGGTTG GCAACGGTGC ATGTGAATTT GATGTTGGCC CGAATGATTC AGAATTTGA
301 ATGGTCCGCT TACCCGGAAT ATAGGAAAGT GGATTTTACT GAGAAATTGG AATTTACTGT
361 GGTGATGAAA AATCCTTTAA GAGCTAAGGT CAAGCCAAGA ATGCAAGTGG TGTAAATTCAT
421 TAAGATTATA AGTCCAAAAA TAAGC

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**SEQ. ID. NO. 508**

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1 TYVTFTHAVT EPTTLGGYDI PTYANVEFFV PGISDDPKVW SDPEKFDPDPR FLSGREDADI
61 TGVTVGVKMP FGVGRRICPG LGLATVHVNL MLARMIQEFE WSAYPENRKV DFTEKLEFTV
121 VMKNPLRAKV KPRMQVV

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**SEQ. ID. NO. 509**

D285-AD7

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1 AGAAGAGATA GACATGAAAG TGGGTAAAGA GAGGTGGATT GAAGATACTG ACATAAAAAA
61 TTTAGTGTAC CTTCAAGGCTA TCGTTAAAGA GACATTGCGC TTGTATCCAC CTGTTCTTTT
121 TCTTTTACCA CACGAAGCAG TGCAAGATTG TAAAGTGACT GGTTACCACA TTCTTAAAGG
181 TACTCGTCTA TATATCAATG CGTGGAAAGT ACATCGCGAT CCTGAAATTT GGTCAGAGCC
241 CGAAAAGTTT ATGCCCAATA GATTCTTGAC TAGCAAAGCA AATATAGATG CTCGCGGTCA
301 AAATTTTGAA TTTATACCGT TTGGTTCTGG GAGACGGTCA TGTCCAGGGA TAGGTTTTGC
361 GACTTTTAGTG ACACATCTGA CTTTTGGTCG CTTGCTTCAA GGTTTTGATT TTAGTAAGCC
421 ATCAAAACACG CCAATTGACA TGACAGAAGG CGTAGGCGTT ACTTTGCCTA AGGTTAATCA
481 AGTTGAAGTT CTAATTATCC CTCGTTTACC TTCTAAGCTT TATTTATTTT GAAAGTGCAA
541 ATCATCAATC ATGGGTTGAG TAATTAGTGA TACT

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**SEQ. ID. NO. 510**

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1 EEIDMKVGKE RWIEDTDIKN LVYLQAI VKE TLRLYPPVPF LLPHEAVQDC KVTGYHIPKG
61 TRLYINAWKV HRDPEIWSEP EKFMNPRFLT SKANIDARGQ NFEFIPFGSG RRSCP GIGFA
121 TLVTHLTFGR LLQGFDFSKP SNTPIDMTEG VGVTL PKVNQ VEVLIIPRLP SKLYLF

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**SEQ. ID. NO. 511**

D285-AH9

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1 AACATTTGGC AATATAGTCT TCCTCCTCAG TTCTTGCCTC CTGTTCTCTTA GAAATAATGG
61 ATTATCATAT TTCTTTCCAT CTTCCAACCTC TTTTGGGGCT TTTTGCCTTT GTGTTCTTGT
121 CTATTATCTT ATGGAGAAGA AACTCAATT CAAGAAGATT AGCCCCTGAA ATCCCAGGGG
181 CATGGCCTAT TATAGGCCAT CTTGTCGAGC TGAGTGGTAC TGATAAGAAT ATCCCATTTC
241 CCCGAATATT GGGCGCTTTG GCAGATAAAT ATGGACCTGT CTTCACTG AGAATAGGGA
301 TGTACCCCTA TTTGATTGTC AACAATTGGG AAGCAGCTAA GGATTGTCTC ACAACGCATG

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361 ATAAGGACTT CGCTGCCCCG CCAACTTCTA TGGCTGGTGA AAGCATCGGG TACAAGTATG
421 CGAGGTTTAC TTATGCTAAT TTTGGTCCTT ATTATAACCA AGTGCGCCAA CTAGCCCTAC
481 AACATGTACT CTCGAGTACT AAACCTCGAGA AAATGAAACA CATACGTGTT TCTGAATTGG
541 AAAC TAGCAT CAAA GAATTA TATTC TTTGA CGCTGGGCAA AAACAACATG CAAAAAGTGA
601 ATATAAGTAA ATGGTTTGAA CAATTGACTT TAAACATAAT CGTGAAGACA ATTTGTGGCA
661 AGAGATATAG CAACATAGAG GAGGATGAAG AGGCACAACG TTTCAGAAAG GCATTTAAGG
721 GCATCATGTT TGTGTAGGG CAAATTGTTT TATATGACGC AATTCCATTC CCATTGTTCA
781 AATACTTTGA TTTCCAAGGT CATATACAAT TGATGAACAA AATT TATAAA GACTTAGATT
841 CTATTCTTCA AGGATGGTTG GATGATCATA TGATGAACAA GGATGTAAAC AATAAGGATC
901 AAGATGCCAT AGATGCCATG CTTAAGGTAA CACA ACTTAA TGAATTCAAA GCCTATGGTT
961 TTTCTCAGGC CACTGTGATC AAGTCGACAG TCTTGAGTTT GATCTTAGAT GGAAATGACA
1021 CAACCGCTGT TCATTTGATA TGGGTAATGT CCTTATTACT GAACAATCCA CATGTTATGA
1081 AACAAGGCCA AGAAGAGATA GACATGAAAG TGGGTAAAGA GAGGTGGATT GAAGATA

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**SEQ. ID. NO. 512**

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1 MDYHISFHLF TLFGLFAFVF LSIILWRRTL NSRRLAPEIP GAWPIIGHLR QLSGTDKNIP
61 FPRILGALAD KYGPVFTLRI GMYPYLIVNN WEAAKDCLTT HDKDF AARPT SMAGESIGYK
121 YARFTYANFG PYYNQVRKLA LQHVLSSSTKL EKM KHIRVSE LETSIKELYS LTLGKNNMQK
181 VNISKWFQEL TLNII VKTIC GKRYSNIEED EEAQRFRKAF KGIMFVVGQI VLYDAIPFPL
241 FKYFDFQGHI QLMNKIYKDL DSILQGWLDD HMMNKDVNNK DQDAIDAMLK VTQLNEFKAY
301 GFSQATVIKS TVLSLILDGN DTTAVHLI WV MSLLLNNPHV MKQGQEEIDM KVGKERWIED

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**SEQ. ID. NO. 513**

D99-AB3

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1 GTAAATGAAG AAGATGTCCA AACATCCCT TATTTTAAAG CAGTGATAAA GGAAATATTT
61 AGATTGTATC CACCAGCTCC ACTTTTAGTT CCAAGAGAAT CAATGGAAAA AACCATATTA
121 GAAGGTTATG AAATTCGGCC AAGAGCCATA GTTCATGTTA ACGCTTGGGC TATAGCAAGG
181 GATCCTGAAA TATGGGAAAA TCCAGATGAA TTTATACCTG AGAGATTTTT GAATAGCAGT
241 ATCGATTACA GGGT

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**SEQ. ID. NO. 514**

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1 VNEEDVQNIP YFKAVIKEIF RLYPPAPLLV PRESMEKTIL EGYEIRPRAI VHVNAWAIAR
61 DPEIWENPDE FIPERFLNSS IDYR

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**SEQ. ID. NO. 515**

D99-AC2

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1 AAGAGTAATG GTGCATTAGG AGGTGAAGAT CTAATTGATG TCCTACTAAG ACTTAAGAAT
61 GATACAAGTC TTCAATTTCC CATCACCAAC AACAAATATCA AAGCTGTTAT TGTGACATG
121 TTTGCTGCCG GAACGGAAAC TTCATCAACA ACAACTGTAT GGGCTATGGC TAGGGACAAA
181 AAGAATCCAA GTGTATTAC CAAAGCTCAA GCAGAAGTGC GAGAAGCCTT TAGGGACAAA
241 GTATCTTTTG ATGAAAACGA TGTGGAGGAG CTGAAATACT TAAAGTTAGT CATTAAAGAA
301 ACTTTGAGAC TTCATCCACC CTCTCCACTT TTGGTCCCAA GAGAATGCAG GGAAGACACA
361 GATATAAACG GCTACACTAT TCCTGCGAAG ACCAAAGTTA TGGTTAATGT TTGGGCATTG
421 GGAAGAGATC CAAAATATTG GGATGACGCC GAAAGCTTTA AGCCAGAGAG ATTTGAGCAA
481 TGCTCTATGG ATTTTTTTTG TAATAATTTT GAGTTTCTT

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**SEQ. ID. NO. 516**

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1 KSN GALGGED LIDVLLRLKN DTS LQFPITN NNIKAVIVDM FAAGTETSST TTVWAMAEMM
61 KNPSVFTHAQ AEVREAFRDK VSF DENDVEE LKYLKLVIKE TLRLHPPSPL LVPRECREDT
121 DINGYTIPAK TKVMVNVWAL GRDPKYWDDA ESFKPERFEQ CSMDFFGNNF EFLP

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**SEQ. ID. NO. 517**

D99-AF11

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1 TTAAACCACC CTGAAACTCT GAAGAAAGCA CAAGCTGAAA TTGATGAACA TATAGGACAT
61 GAACGTTTAG TGGACGAGTC GGACATCAAC AACCTACCTT ACCTACGTTG TATAATCAAC
121 GAGACATTCC GAATGTACCC TGCAGGACCA CTACTAGTCC CACACGAGTC GTCAGAGGAA
181 ACCACCGTAG GAGGCTACCG TGTACCCGGA GGAACCATGT TACTTGTGAA TTTGTGGGCT

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241 ATTCACAATG ATCCAAAGCT ATGGGATGAA CCAAGAAAGT TTAAGCCAGA AAGATTTGAA  
 301 GGACTAGAAG GTGTTAGAGA TGGTTACAAA ATGATGCCCT

**SEQ. ID. NO. 518**

1 LNHPELTKKA QAEIDEHIGH ERLVDESIN NLPYLRICIIN ETFRMYPAGP LLVPHESSSE  
 61 TTVGGYRVPV GTMLLVNLWA IHNDPKLWDE PRKFKPERFE GLEGVRDGYK MMP

**SEQ. ID. NO. 519**

D99-AH4

1 GTCAGGTTTC ATCCTATAGC TCCAGTATTA GCACCTAGAG AATCAAGGGA AGAGTGTGAG  
 61 ATTAATGGCT ATGTTATACC AAAAGGCACA ATGGCCCTTG TGAATTTTGG GGCAATTTCT  
 121 AGGGATCCAA ATTATTGGTC AAATCCTGAA ACATTTGATC CAGAGAGATT TAATGAAAGT  
 181 CACCTTGATT TTACTGGAGC TCATTTCGAG TTTACGCC

**SEQ. ID. NO. 520**

1 VRFHPIAPVL APRESREECE INGYVIPKGT MALVNFWAIS RDPNYWSNPE TFDPERFNES  
 61 HLDFTGAHFE FT

**SEQ. ID. NO. 521**

D99-AH7

1 GTTATTTGGG CATTAGCAGA AATGATAAAG AATCCAAGTG TAATGGCGAA AGCACAAGCA  
 61 GAAGTGAGAG AAGCTTTTAA AGGAAAGAAA ACATGTGATG AGGATACTGA TCTTGAAAAG  
 121 CTTAGTTACC TAAATTTAGT GATCAAAGAG ACACTCCGAT TACACCCTCC AACTCCTCTA  
 181 CTTGTCCCGC GAGAATGCAG GGAGGAAACA GAGATTGAAG GATTCACAT ACCGTTGAAA  
 241 AGCAAAGTCT TGGTTAACGT ATGGGCAATT GGAAGAGATC CCGAGAATTG GGGAAATCCT  
 301 GAATGTTTTA TACCAGAGAG ATTCGAAAAAT AGTTCTATTG AGTTTACTGG AAATCATTTT  
 361 CAACTTCTT

**SEQ. ID. NO. 522**

1 VIWALAEMIK NPSVMAKAQA EVREAFKGGK TCDEDTDLEK LSYLNLVIKE TLRLHPPTPL  
 61 LVPRECREET EIEGFTIPLK SKVLVNVWAI GRDPENWGNP ECFIPERFEN SSIEFTGNHF  
 121 QLL

**SEQ. ID. NO. 523**

D99-DB4

1 GAATATCTTG GTGAAGGTTA CTCTCGTGAT ACTGTCATTA AAGCAACGGT GTTTAGTTTG  
 61 GTCTTGATG CAGCAGACAC AGTTGCTCTT CACATAAATT GGGGAATGGC ATTATTGATA  
 121 AACAAATCAA AGGCCTTGAC GAAAGCACAA GAAGAGATAG ACACAAAAGT TGGTAAGGAC  
 181 AGATGGGTAG AAGAGAGTGA TATTAAGGAT TTGGTATACC TCCAAGCTAT TGTTAAAGAA  
 241 GTGTTACGAT TATATCCACC AGGACCTTTG TTAGTACCAC ACGAAAATGT AGAAGATTGT  
 301 GTTGTTAGTG GATATCACAT TCCTAAAGGG ACAAGATTAT TCGCAAACGT CATGAAACTG  
 361 CAACGTGATC CTAAACTCTG GTCTGATCCT GATACTTTTCG ATCCAGAGAG ATTCATTGCT  
 421 ACTGATATTG ACTTTCGTGG TCAGTACTAT AAGTATATCC CC

**SEQ. ID. NO. 524**

61 RWVEESDIKD LVYLQAIKVE VLRLYPPGPL LVPHENVEDC VVSGYHIPKG TRLFANVMKL  
 121 QRDPKLWSDP DTFDPERFIA TDIDFRGQYY KYI

**SEQ. ID. NO. 525**

D99-DG4

1	CTTATGGTGG	ATTTATTCAT	TGCTGGAAGT	GACACATCTG	CTATAACAAC	AGAATGGGCA
61	ATGGCAGAAC	TTCTTCGAAA	ACCTCAAGTA	CTTAACAAAG	TAAGAGAAGA	AATACTTCAA
121	CAAATAGGCA	CAGAAAGACC	AGTGAAAGAA	TCAGACATTG	AGAAACTTCC	ATACCTTCAA
181	GCAGTTGTAA	AAGAAGCAAT	GAGACTTCAT	CCGGCAGTTT	CATTACTCTT	GCCACACAAA
241	GCCCCAAAATG	ATATACAAGT	GTTGGGCTAC	ACTGTGCCTA	AGAACACTCA	AGTTCTCGTG
301	AATGCTTGGG	CAATTGGAAG	AGATCCAAAA	TCCTGGGATA	AGCCACTGGA	GTTTATGCCT
361	GAAAGATTCA	TAAAGTCTAG	TGTGGATTAC	AAAGGTAGGG	ACTTTGAGTT	TATACCC

**SEQ. ID. NO. 526**

1	LMVDLFIAGS	D TSAITTEWA	MAELLRKPQV	LNKVREEILQ	QIGTERPVKE	SDIEKLPYLQ
61	AVVKEAMRLH	PAVSLLLPHK	AQNDIQVLGY	TVPKNTQVLV	NAWAIGRDPK	SWDKPLEFMP
121	ERFIKSSVDY	KGRDFEFIP				

**SEQ. ID. NO. 527**

D40-2

1	CACATGAAAA	TGTAAAGGAT	TGTGTTGTTA	GTGGATATCA	CATTCTCTAA	GGGACTAGAT
61	TATTCGCAAA	CGTCATGAAA	CTGCAGCGCG	ATCCTAAACT	CTTGTCAAAT	CCTGATAAGT
121	TCGATCCAGA	GAGATTCATC	CTGGGTGATA	TTGACTTCCG	TGGTCACCAC	TATGAGTTTA
181	TCCCATTGTTG	TTCTGGAAGA	CGATCTTGTC	CGGGGATGAC	TTATGCATTG	CAAGTGGAAC
241	ACCTAACAAT	GGCACATTTA	ATCCAGGGTT	TCAATTACAA	AACTCCAAAT	GACGAGGCCCT
301	TGGATATGAA	GGAAGGTGCA	GGCATAACAA	TACGTAAGGT	AAATCCAGTG	GAATTGATAA
361	TAACGCCTCG	CTTGGTACCT	GAGCTTTACT	AAAACCTAAG	ATCTTTTCATC	TTGGTTGATC
421	ATTGGTTAAT	ACTCCTAGAT	GGGTATTTCAT	TTACCTTTTT	TCAATTAATT	GCATGTCCAG
481	CTTTTTTAAT	TTGGTATATT	T			

**SEQ. ID. NO. 528**

1	HENVKDCVVS	GYHIPKGTRL	FANVMKLQRD	PKLLSNPDKF	DPERFIAGDI	DFRGHHYEFI
61	PFGSGRRSCP	GMTYALQVEH	LTMAHLIQGF	NYKTPNDEAL	DMKEGAGITI	RKVNPELII
121	TPRLVPELY					

**SEQ. ID. NO. 529**

D301-EE11

1	TATAAGTATA	TCCCGTTTGG	TTCTGGAAGA	CGATCTTGTC	CAGGGATGAC	TTATGCATTG
61	CAAGTGGAAC	ACTTAACAAT	GGCACATTTG	ATCCAAGGTT	TCAATTACAG	AACTCCAAAT
121	GACGAGCCCT	TGGGTATGAA	GGAAGGTGCA	GGCATAACTA	TACGTAAGGT	AAATCCTGTG
181	GAACTGATAA	TAGCGCCTCG	CCTGGCACCT	GAGCTTTATT	AAAACCTAAG	ATCTTTTCATC
241	TTGGTTGATC	ATTGTATAAT	ACTCCTAAAT	GGATATTTCAT	TTACCTTTTA	TCAATTAATT
301	GTCA					

**SEQ. ID. NO. 530**

1	YKYIPFGSGR	RSCPGMTYAL	QVEHLTMAHL	IQGFNYRTPN	DEPLGMKEGA	GITIRKVNPNV
61	ELIIAPRLAP	ELY				

**SEQ. ID. NO. 531**

D302-AE10

1	TTTTAAAGAT	ATAGATTCTG	TTTTTCAGAA	TTGGTTAGAG	GAACGTATTA	ATAAAAGAGA
61	AAAAATGGAG	GTTAATGCAG	AAGGGAATGA	ACAAGATTTT	ATTGATGTGG	TGCTTTTCAA
121	AATGAGTAAT	GAATATCTTG	GTGAAGGTTA	CTCTCGTGAT	ACTGTTATTA	AAGCAACGGT
181	GTTTAGTTTG	GTCTTGATG	CAGCAGACAC	AGTTGCTCTT	CACATAAATT	GGGGAATGGC
241	ATTATTGATA	AACAATCAAA	ATGCCTTGAT	GAAAGCACAA	GAAGAGATAG	ACACAAAAGT
301	TGGTAAGGAT	AGATGGGTTAG	AAGAGAGTGA	TATTAAGGAT	TTAGTATACC	TCCAAGCTAT
361	TGTTAAAAAG	GTGTTACGAT	TATATCCACC	AGGACCTTTG	TTA	

**SEQ. ID. NO. 532**

1 FKDIDSVFQN WLEERINKRE KMEVNAEGNE QDFIDVVL SK MSNEYLGEY SRDTVIKATV  
61 FSLVLDAADT VALHINWGMA LLINNQNALM KAQEEIDTKV GKDRWVEESD IKDLVYLQAI  
121 VKKVLRLYPP GPLL

**SEQ. ID. NO. 533**

D303-AC6

1 TATAAGTATA TCCCGTTTGG TTCTGGAAGA CGATCTTGTC CAGGGATGAC TTATGCATTG  
61 CAAGTGGAAC ACTTAACAAT GGCACATTTG ATCCAAGGTT TCGATTACAG AACTCCAAAT  
121 GACGAGCCCT TGGATATGAA GGAAGGTGCA GGCATAACTA TACGTAAGGT AAATCCTGTG  
181 GAACTGATAA TAGCGCCTCG CCTGGCACCT GAGCTTTATT AAAACCTAAG ATCTTTCATC  
241 TTGGTTGATC ATTGTATAAT ACTCCTAAAT GGATATTCAT TTACCTTTTA TCAATTAATT  
301 GTCA

**SEQ. ID. NO. 534**

1 YKYIPFGSGR RSCPGMTYAL QVEHLTMAHL IQGFDYRTPN DEPLDMKEGA GITIRKVNPFV  
61 ELIIAPRLAP ELY

**SEQ. ID. NO. 535**

D303-AC11

1 GAGATTCATT GCTACTGATA TTGACTTTTCG TGGTCAGTAC TATAAGTATA TCCCGTTTGG  
61 TTCTGGAAGG CGATCTTGTC CAGGGATGAC TTATGCATTG CAAGTGGAAC ACTTAACAAT  
121 GGCACATTTG ATCCAAGGTT TCAATTACAG AACTCCAAAT GACGAGCCCT TGGATATGAA  
181 GGAAGGTGCA GGCATAACTA TACGTAATGT AAATCCTGTG GAACTGATAA TAGCGCCTCG  
241 CCTGGCACCT GAGCTTTATT AAAACCTAAG ATCTTTCATC TTGGTTGATC ATTGTATAAT  
301 ACTCCTAAAT GGATATTCAT TTACCTTTTA TCAATTAATT GTCA

**SEQ. ID. NO. 536**

1 RFIATDIDFR GQYYKYIPFG SGRRSCPGMT YALQVEHLM AHLIQGFNYR TPNDEPLDMK  
61 EGAGITIRNV NPVELIAPR LAPELY